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Evaluation of the Off-Line Electronic Benefits Transfer Demonstration

The Impacts of the Off-line EBT Demonstration on the Food Stamp Program

Volume II - Impacts on Recipients, Retailers, and Financial Institutions

**The Impacts of the Off-line EBT Demonstration
on the Food Stamp Program**

**Volume II - Impacts on Recipients,
Retailers, and Financial Institutions**

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THE IMPACTS OF THE OFF-LINE EBT DEMONSTRATION ON THE FOOD STAMP PROGRAM

The evaluation of the off-line electronic benefits transfer demonstration is presented in three volumes and an Executive Summary.

The Executive Summary presents a concise review of the evaluation and the major findings.

Volume I provides an analysis of the economic impact of off-line EBT on food stamp operations. It also looks at the financial impact of expanding the demonstration.

Volume II describes the costs and other impacts of the off-line EBT system on retailers, recipients, and financial institutions. This research includes both qualitative and quantitative impacts and provides a comparative assessment of off-line EBT versus the paper coupon system.

Volume III describes the off-line EBT system design, development and implementation process; system operations; and, lessons learned. The purpose of this volume is to provide guidance for other EBT development efforts.

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Chapter 1

INTRODUCTION

The Food and Nutrition Service (FNS) initiated an off-line electronic benefit transfer (EBT) demonstration system in 1990 to test an application of off-line technology for delivering food stamp benefits. The off-line EBT system uses an intelligent chip or "smart" card to store the recipient's primary record and account balance. Benefits are loaded into the card's memory chip once a month and are accessed through special terminals at the point of sale in retail food stores. Each purchase transaction decrements the balance carried on the recipient's card. Once a day the retailer initiates a settlement transaction to the host which transmits all of the day's EBT transactions. A credit to the retailer is then initiated by the host. The off-line demonstration EBT system was designed, developed, and implemented in Montgomery County (Dayton), Ohio by National Processing Company (NPC) under contract to FNS. Previous demonstrations of EBT using magnetic stripe cards and on-line access to host computers had established the feasibility of that technology for delivering benefits reliably and effectively.

To evaluate the off-line EBT demonstration system, FNS contracted with Phoenix Planning & Evaluation, Ltd. and its subcontractors Market Facts, Inc. and The Orkand Corporation. The five objectives of the evaluation were to:

- describe the design, development, implementation, and operation of the off-line EBT system;
- estimate the cost-effectiveness of the off-line EBT system;
- estimate and compare the costs of the off-line EBT system to the coupon issuance system that preceded it and to on-line EBT systems;
- describe and compare the impact of the off-line EBT system on each of the groups participating in the demonstration; and
- explore the feasibility of continuing or expanding the project.

RESEARCH DESIGN

The evaluation of impacts on retailers, recipients, and financial institutions was based on primary data collected from representative samples of those participating groups. Pre-implementation data were collected through interviews with retailers, recipients, and financial institutions prior to the implementation of the EBT system. Post-implementation data were collected after the EBT system had reached stable operation. Those two waves of data collection supported analyses of how costs, behaviors, and perceptions changed under off-line EBT compared to the paper coupon issuance system that preceded it.

Interviews with retailers and financial institutions were conducted in person and by telephone. Appendix A lists the retailers participating in the evaluation, grouped by store type. Recipient interviews were conducted by telephone when possible, and in-person when telephone contact could not be established. The retailer surveys in both waves were completed with all retailers who had agreed to participate in the demonstration as of the time of the pre-implementation wave.

Additional data collection produced information used to estimate impacts of EBT on the operation of the check-out counters of retail grocers. Stores were selected randomly with probability proportional to food stamp redemptions within the three major types of stores: supermarkets, grocery stores, and convenience stores. Trained observers timed more than 9,500 transactions using electronic split-time stopwatches and recorded the amount and mode of payment, the number of items in each transaction and other characteristics of the transaction that could affect the time taken to complete the transaction, such as price checks or weighing produce. Check-out observations methodology and analysis are provided in Appendix B. Analyses of covariance on the resulting data estimated the impacts of payment mode on the length of transactions while controlling for other factors. Appendix C provides information on handling cost outliers.

The design for the recipient impact evaluation included the use of a comparison site in Franklin County Ohio. The comparison site helped to assure that any changes observed from pre-implementation to post-implementation in the test site could be interpreted in light of changes

occurring in a similar recipient population that was not affected by the demonstration EBT system. The comparison site consisted of three zip codes in Franklin County that had highly similar demographic characteristics to those in Montgomery County. The Food Stamp Program (FSP) is administered in similar ways in Franklin and Montgomery counties, another criterion for selection of a comparison site. Full details of how the comparison site was selected appear in Appendix D in this volume.

Samples of recipients were drawn from all certified households residing in the demonstration area and in the comparison site. Stratified random samples were drawn to yield a minimum of 772 completed recipient interviews in each site in each wave. Details of the sample disposition appear in Appendix E.

Officials of financial institutions (FIs) were interviewed during both pre-implementation and post-implementation periods. Pre-implementation interviews were conducted with officials at all of the FIs to which retailers participating in the demonstration deposited food coupons and with the Cincinnati Federal Reserve Bank (FRB), which processes food coupons for the demonstration area. Post-implementation interviews were conducted with FIs that receive EBT credits for retailers, the EBT concentrator bank, and the Cleveland FRB.

EVALUATION HIGHLIGHTS - VOLUME II

Impacts on Retailers

EBT significantly changes the operations of retailers. These changes may have either positive or negative impacts on the retailers, and they occur with both on-line and off-line systems. Both EBT systems eliminate the need for handling and depositing coupons and funds are credited to the retailer electronically. On the down side, retailers have objected to the delays in check-out operations when the system is down or problems result in inadequate response time. In the on-line demonstrations, many of these problems were the result of the requirement to receive authorization from a host processor for each transaction. Because the off-line system does not require this on-line communication with the host for authorization, it is not as prone to system-wide or store-wide failures.

Retailer Perceptions

In the pre-implementation interviews, retailers expected that many benefits would be associated with the new off-line EBT system. However, they did not expect that the new system would have a substantial impact on check-out lane productivity and operating costs. Similarly, during the post-implementation interviews, retailers continued to report many benefits of EBT, but contrary to actual results, they perceived little savings in terms of check-out lane productivity and operating costs.

Retailer Costs

The overall participation costs for retailers decreased \$9.52 per \$1,000 of benefits redeemed under the off-line system. On average, retailers reported costs of \$24.73 per \$1,000 of benefits redeemed in the pre-implementation, and \$15.21 with off-line EBT. This decrease in costs held true for all four retailer categories (supermarkets, grocery stores, convenience stores and other stores).

The reduction in time required for coupon handling and reconciliation represented the biggest savings area for off-line EBT over the paper coupon system. All store types reported a savings in this area.

Retailers reported minor savings in float costs (the costs of foregone interest on food stamp deposits). The average cost savings was \$0.14 per \$1,000 of benefits redeemed, and derived almost entirely from a reduction in the time between the food stamp purchase and the time the retailer was credited for the purchases at their bank. The daily settlement of food stamp transactions in the off-line EBT system eliminates the portion of the float cost incurred when retailers do not make food coupon deposits daily.

In general, the cost to the retailer of food stamp training activities decreased, although the impact differed substantially by store type. However, retailers reported an increase in costs associated with reshelfing items that food stamp recipients could not purchase due to insufficient benefits.

Accounting error costs increased slightly under the off-line EBT system for most retailers. This overall increase in reported errors could be due to difficulties experienced by retailers in the initial stages of implementation resulting from system fine-tuning during the early operations period, or to the initiation of new reconciliation procedures in the stores. Grocery stores, convenience stores, and other stores reported an increase in accounting error costs under the new system. The increase in costs ranged from a high of \$1.71 in grocery stores to an increase of only \$0.08 in convenience stores. However, supermarkets experienced a decrease in accounting error costs (\$0.42).

Impacts on Recipients

Recipients incur costs to participate in the FSP, and those costs reduce the effective value of the benefits received. Costs include direct out-of-pocket expenses, the value of the recipients time spent in obtaining benefits and resolving issuance problems and the opportunity cost of benefits delayed, lost or stolen.

Cost of Participation

In Montgomery County, EBT eliminates the need for recipients to travel to an issuance office to obtain their food stamp benefits. EBT also provides for the replacement of benefits reported as lost or stolen, which is not possible under coupon issuance. As a result, participation costs for recipients decreased in Montgomery County from \$13.39 per month under coupon issuance to \$2.52 under EBT, a saving of \$10.87 per month on average. Recipients in the comparison site reported a small drop in participation costs (\$1.46) that could not have been due to EBT. When the apparent savings from EBT are reduced by that amount, recipients still save \$9.41 per month on average.

Recipients saved in all three cost categories, but their largest savings were in time and opportunity costs. By eliminating the need to travel to pick up food coupons, recipients saved an average of one and one-fourth hours per month, which, valued at the minimum wage, was worth \$5.27 per month. Opportunity cost savings of \$2.13 per month resulted from the EBT

issuance system's more reliable delivery of benefits on time and in the proper amount. Benefits that were lost or stolen and not replaced fell by an average of \$1.88 per month.

Problems in Using Food Stamp Benefits

It was anticipated that recipients might have difficulty keeping track of their remaining balances and sometimes must return items at the check-out because they had less than expected in their accounts. Most recipients were successful in keeping track of their balances, and only nine percent ever had less than expected in their accounts. Nearly all recipients keep their printed EBT receipts that show the balance on the card, and about half use account balance terminals in stores. Few recipients call PayEase customer service to learn their balances. Although retailers reported an increase in reshelfing under EBT, recipients perceptions indicated a decrease in the number of items they had to return while shopping. About 12 percent of the recipients reported that they had to return items when using the PayEase card, compared to a reported 21 percent who had to return items when shopping with coupons. The mean number of times recipients had to return items also dropped from 3.1 times to about 2.5 times.

Off-line EBT users reported several types of problems encountered when using their cards at the check-out. About half experienced store computer equipment that was not working (47 percent), and 38 percent reported the EBT system's working slowly. Those rates were higher than reported for on-line EBT systems in New Mexico and Ramsey County, Minnesota. Eleven percent forgot their personal identification number (PIN) and four percent had to get a new PIN. Only 10 percent reported that the store had to do a back-up manual transaction, substantially fewer than for the on-line systems (25 and 17 percent, respectively).

Partially equipped stores posed some problems for EBT users. Of those who had shopped in partially equipped stores, 25 percent had difficulty knowing which lanes accepted PayEase cards. Some felt awkward or embarrassed using a special lane (16 percent), and 45 percent felt they had to wait longer in PayEase equipped lanes.

Perceived Impacts on Program Integrity

Recipients perceive that it is harder to buy ineligible items with EBT than with coupons. Under EBT, 64 percent of recipients perceived it would be very hard to buy ineligible items such as alcohol or tobacco, compared to 55 percent under coupons. With EBT, 37 percent felt it would be very hard to trade benefits for cash, while only 14 percent said it was very hard to trade coupons for cash. When asked to estimate the street price of food stamp benefits, under coupons recipients estimated someone trading benefits for cash could get \$0.57 per dollar of benefits. Under EBT, that estimate fell to \$0.50. When the risk or difficulty of converting purchased benefits into cash rises, traffickers should be willing to pay less for those benefits. The lower estimated street price of EBT benefits suggests that, at least for now, EBT poses greater barriers to profitable trafficking.

Preferences for Coupons or EBT

Recipients who had used both coupons and off-line EBT were asked which they preferred. By a margin of 64 percent to 26 percent, recipients who had experienced both systems preferred EBT. Strong as that preference appears, the on-line systems in New Mexico and Ramsey County elicited even higher preference choices (89 percent in New Mexico and 76 percent in Ramsey County preferred EBT). Recipients also perceived that shopping with EBT is easier than with coupons and that EBT requires fewer trips to the welfare office. The benefits they cited most frequently were that it is easier to know their balances with the card, that cards are less likely than coupons to get lost or stolen and that it is harder to sell benefits for cash with the card.

Impacts on Financial Institutions

Financial institutions (FIs) have a crucial role in processing food stamp benefits which are redeemed by the recipients and accepted by the retailers. Financial institutions initiate the transfer of funds from the Food Stamp Program's account at the U.S. Treasury to the retailer's account at their financial institution. The FIs include the retailer's banks, the Federal Reserve Bank and in the case of EBT, the concentrator bank selected by the processor.

In general, FIs welcome the transition of food stamp benefit delivery from a paper to an automated procedure. Processing of paper food coupons is labor intensive, and in many instances the cost incurred by the retailer's FI in providing the service of accepting, counting, cancelling, reconciling, bundling, and transporting food coupons to the Federal Reserve Bank cannot be passed on to the retailer. The reduction or elimination of paper processes at a financial institution decreases the possibility of a manual error. This is also true at the FRB where electronic credits to the retailer's specified account at a financial institution are processed without the need for any manual intervention. Paper coupons are no longer transported from banks to the Federal Reserve, where they must be counted to verify the financial institutions totals, and subsequently destroyed.

Under EBT, when FIs were questioned about the processing of retailer credits representing food stamp benefit redemptions, there was an element of surprise that these credits were being processed. The credits to the retailer's accounts are incorporated with other electronic credits processed through the automated clearing house (ACH), making the process virtually transparent to the FIs. Two of the FIs used by retailers in the Dayton area reported charging a retailer to receive an electronic credit to an account. In both of these instances, the "per credit" charge more than covered the cost of providing the service when viewed in terms of per \$1,000 benefits redeemed.

The concentrator bank has no role in the paper food coupon process, but plays a major role in EBT. The concentrator bank receives the file of credits to retailers from the processor, edits the file to determine the dollar amount of the file and the number of retailer credits, and submits the file to the ACH for further processing and distribution to the retailer's bank. Using the ACH, retailer credits can be transmitted to any bank in the U.S. Thus, large retailers are not restricted to maintaining a local bank account enabling more efficient use of their funds in an industry which functions on low profit margins.

ORGANIZATION OF VOLUME II

Volume II consists of this introductory chapter and three additional chapters. Chapter 2 evaluates the impacts of the off-line EBT system on retailers. It analyzes the costs of participation for retailers under the off-line EBT and the preceding coupon issuance systems and

compares those costs to on-line EBT systems. The chapter also presents retailers' opinions and perceptions about the off-line EBT system, its impact on their operations, and its effects on fraud and benefit diversion.

Chapter 3 presents an evaluation of the impacts on recipients. It focuses on costs of participation under the coupon and off-line EBT issuance systems and compares those costs to on-line EBT systems. It also discusses the timeliness and accuracy of benefit issuance, problems recipients encounter in using their benefits, estimated effects of EBT on fraud and benefit diversion, changes in shopping patterns, and possible effects of off-line EBT on participation in the FSP.

Chapter 4 presents the evaluation of impacts of off-line EBT on financial institutions. It presents qualitative and quantitative analyses of operations and costs to financial institutions under off-line EBT and the paper coupon systems.

Chapter 2

IMPACT OF THE OFF-LINE EBT SYSTEM ON PARTICIPATING RETAILERS

INTRODUCTION

The Food Stamp Program was established to increase the food purchasing power of low-income households for the specific purpose of purchasing a nutritionally adequate low-cost diet through the issuance of food coupons. The Field Offices of the Food and Nutrition Service authorize food retailers to participate in the Food Stamp Program (FSP). Authorized food stamp retailers play an important role in the Food Stamp Program by exchanging food coupons for authorized food items. Food retailers participate voluntarily in the Food Stamp Program.

The Food Stamp Program can have an important impact on participating retailers; both the costs and the benefits to the retailer of participating in the program can be substantial. By increasing the resources that low-income households have to spend for food, the program stimulates additional demand for food, which translates into increased revenue for retailers. However, under the paper coupon system, these increased revenues come into the stores in a non-standard payment form which requires special treatment from store employees. Retailers must provide their cashiers with additional training in the requirements of the Food Stamp Program. Additional time is required to handle and reconcile the food stamp coupons, and to reshelf items that cannot be purchased because they are ineligible for the program or because a client does not have enough food stamps. Acceptance of food stamp benefits as payment may affect the productivity at check-out lanes and impact increasing costs incurred for front-end operations.

The introduction of EBT into the Food Stamp Program also involves costs and benefits to participating retailers. The equipment required to process EBT transactions may require more skill to operate than other check out equipment in many stores, and retailers may need to provide additional training or hire more proficient cashiers at higher wage rates. Benefits to the retailer of the EBT system include the elimination of time spent handling, reconciling, and depositing food stamp coupons.

Objectives of the Retailer Impact Evaluation

The primary purpose of the retailer impact evaluation was to measure the costs of participation in the Food Stamp Program under the off-line EBT system and the coupon system it replaced. In particular, the evaluation sought to measure the costs to retailers resulting from the following activities:

- food stamp handling and reconciliation;
- accounting errors;
- float on food stamp receipts;
- check-out counter operations;
- reshelfing; and
- training of employees.

A second important objective of the evaluation was to assess retailers' perceptions and preferences regarding the off-line EBT system and the food coupon system. EBT significantly changes the operations of retailers in serving food stamp recipients at the check-out counter and in the redemption of food stamp receipts through their banks. These changes may have either positive or negative impacts on the retailers and may affect their satisfaction with the Food Stamp Program. In previous EBT demonstrations, retailers preferred EBT over coupons, largely because EBT eliminates the need for handling and redeeming coupons and because EBT makes it unnecessary to provide cash change from food stamp transactions. On the down side, retailers have objected to the delays in check-out operations when system problems occur, resulting in inadequate response time. In the on-line demonstrations, many of these problems were the result of the requirement to receive authorization from a host processor for each transaction. The off-line system does not require this on-line authorization.

Evaluation Design

The design of the retailer impact evaluation was a pre/post comparison for all of the participating stores in the demonstration area and surrounding fringe area. The first phase of the evaluation was the pre-implementation phase. The purpose of this phase was to establish a

benchmark against which changes that occurred with the off-line EBT demonstration could be measured and compared. Measurements under the second or post-implementation phase, occurred after system operations reached a "steady-state".

Analyses of retailer costs and other impacts were conducted in a manner consistent with previous evaluations wherever possible to assure maximum comparability with those evaluations. Pre-implementation and post-implementation participation costs were estimated separately for each cost category within store type. These costs were summed to estimate total retailer participation costs under the coupon and off-line EBT systems. The on-line systems that were used for comparison purposes throughout these analyses were the state-initiated EBT demonstrations, as evaluated by Abt Associates.¹

To establish the pre-implementation costs of retailer participation in the FSP, data were collected during pre-implementation interviews and check-out observations with participating retailers in the demonstration area in Montgomery County. The data collection period was December, 1991 through January, 1992. Pre-implementation interviews were conducted with all retailers expected to participate in the off-line EBT demonstration. A total of 71 interviews were completed. Retailers were asked about their practices, the costs associated with the food stamp coupon system, and their expectations of the new off-line EBT system.

To establish the comparison costs of retailer participation in the off-line EBT system, data were collected during post-implementation interviews and check-out observations with participating retailers in the demonstration area zip codes in Montgomery County after the system had reached a steady state. The data collection period was November through December, 1992 (after the system had been in operation for approximately 7 months). Post-implementation interviews were conducted with all retailers participating in the off-line EBT demonstration during the field period. Because a number of retailers had joined the program since the beginning of the demonstration, 94 interviews were completed. All but two of the EBT retailers were interviewed in the post-implementation wave; one retailer was on vacation for the entirety of the data collection period, and the second retailer reported that they were no longer

¹ John A. Kirlin, et al., The Impacts of the State-Initiated EBT Demonstrations on the Food Stamp Program, Cambridge, Massachusetts: Abt Associates Inc., June, 1993.

participating in the Food Stamp Program, bringing the total number of authorized retailers to 95. All other EBT retailers were interviewed. Retailers were asked about the costs associated with the off-line EBT system as well as their perceptions of the system.

Methodology for Estimating Retailer Costs

Retailers that participated in the Food Stamp Program were classified into four principal types. Supermarkets have multiple check-out lanes and stock a full line of food items. Small-to medium-sized grocery stores have substantially less shelf space and a more limited selection of foods than supermarkets. Convenience stores offer extended hours of service, but a very limited range of food items, usually at higher prices than elsewhere. Other stores include combination grocery/merchandise stores, health food stores, produce stands and other miscellaneous retailers that are authorized to participate in the Food Stamp Program (see Appendix A for list of retailers included in the evaluation).

Category averages (for supermarkets, grocery stores, convenience stores and other stores) were calculated for both the pre-implementation and the post-implementation waves. These averages were compared to identify any changes in participation costs across the two periods.

Retailer participation costs were identified in two ways -- through retailer interviews and check-out observations -- in both the pre-implementation and post-implementation phases. Check-out observations were conducted in 15 stores that were randomly selected from strata representing supermarkets, grocery stores, and convenience stores. Trained observers observed for three days in each store near the beginning of the month, when food stamp transactions are most common. The data gathered in the observations were used to identify the impact of the off-line EBT system on check-out productivity.

Retailer interviews were used to identify the impact of the off-line EBT system on training, reshelving, handling and reconciliation, check-out productivity, as well as other food stamp-related costs. In the pre-implementation interview, retailers were asked to estimate the amount of time required by each type of employee involved in various activities related to food stamp coupon processing. In the post-implementation interview, retailers were asked to estimate

the amount of time required for off-line EBT processing activities. Retailers were also asked to provide wage rate information for each relevant employee type.

Monthly costs were calculated for each store activity by multiplying the amount of time each employee type spends on a food stamp-related activity by the loaded wage rate for that type of employee. (The loaded wage rate includes the employee's hourly wage rate and the fringe rate reported for part-time or full-time employees for that store.) Wage rates reported by retailers in the pre-implementation wave were factored upward to eliminate the impact of wage inflation on the cost analysis. The change from pre-implementation to post-implementation in the average full-time wage for clerks within each store type was used to determine the amount that other wage rates should be adjusted. Full-time clerks were selected as the basis for the wage inflation factor because they had the most complete reported wage information (almost all stores reported a wage for clerks) in both waves. Any missing wages were imputed within store categories by using a "hot deck" procedure, which randomly selects an actual wage rate for that type of employee to replace the missing value. A "hot deck" procedure is preferred in a situation such as this because it does not reduce the variance of the distribution and therefore has little impact on any tests of differences that would be performed on the data. In both the pre-implementation and post-implementation data collection, missing wage rates occurred almost exclusively among store owners and managers. Missing fringe rates were imputed using industry-average fringe benefit values for each type of benefit that is provided by the retailers to their full-time or part-time employees. The industry-average benefit values are those reported by the trade industry (wholesale and other retail) in the 1991 and 1992 Employee Benefits reports compiled by the U.S. Chamber Research Center.¹

The average cost estimated for each store type represents a weighted average in which each store's cost for a particular activity is weighted by that store's redemption volume relative to the total volume for other stores in the store type. Each store's costs were also standardized

¹ Employee Benefits, 1991 Edition, Special Section on Flexible Benefits. Survey Data from Benefit Year 1990. A Reference Guide for Employers and Benefits Specialists, U.S. Chamber Research Center, U.S. Chamber of Commerce; Employee Benefits, 1992 Edition, Special Section on Flexible Benefits. Survey Data from Benefit Year 1991. A Reference Guide for Employers and Benefits Specialists, U.S. Chamber Research Center, U.S. Chamber of Commerce.

to represent the cost per \$1,000 of food stamp redemptions (total food stamp redemptions in the pre-implementation, and off-line EBT redemptions in the post-implementation wave). Average store redemption levels (for the stores in the evaluation) decreased slightly from the pre-implementation to the post-implementation period, although overall food stamp participation in the demonstration area increased during that same period. This apparent contradiction may be due to the entry of the Meijers chain of stores into the Dayton market during the demonstration period. The Meijers stores drew food stamp shoppers from a wide section of the demonstration area.

RETAILER PERCEPTIONS OF THE OFF-LINE EBT SYSTEM

Retailer perceptions of the costs and benefits of the FSP, and more specifically the off-line EBT system, are fundamental to their willingness to participate in the program. Retailers were asked a wide variety of questions about their expectations and experiences with the off-line EBT system. Those questions are detailed below. The base for these questions is all retailers who had agreed to participate in the EBT program for the pre-implementation, and all participating EBT retailers in the post-implementation wave. The number of retailers in the program increased over the period of the demonstration reflecting both changes in the number of retailers in the Dayton market, and perhaps, increased retailer interest in the EBT program. In contrast to the retailer cost comparison tables, the responses of *all* responding retailers are included in the following tables, because the intent is to examine retailer perceptions of the two different systems, not to measure changes over time. Where similar questions were asked in the evaluation of the state-initiated, on-line systems, comparisons are made between the findings for the off-line and the on-line systems.

Retailer Perceptions

Pre-implementation Perceptions

In the pre-implementation interview, retailers were asked about their expectations for the off-line EBT system. In particular, we sought to identify the following:

- the anticipated major benefits and drawbacks of the EBT system;
- whether the new EBT system would be easier or harder for the retailers than the current coupon system; and
- the anticipated effect of EBT on:
 - check-out productivity,
 - operating costs,
 - total sales,
 - store profits, and
 - fraud and abuse in the FSP.

Retailers were also asked about their perceptions of the level of food stamp fraud and abuse in the food stamp coupon system.

Post-implementation Perceptions

In the post-implementation interview, retailers were asked to describe the impacts of the off-line EBT system on their business. Retailers were asked about the same issue areas as in the pre-implementation interview. A few additional questions were asked as well. Retailers in the post-implementation wave were also asked about their interest in continuing with the off-line EBT program should the state decide to continue the project.

Benefits and Drawbacks of the Off-line EBT System

In the pre-implementation interviews, retailers anticipated that many benefits would be associated with the new off-line EBT system. However, they did not expect that the new system would have a substantial impact on check-out lane productivity and operating costs. Similarly, in the post-implementation interviews, retailers continued to report many benefits associated with the off-line EBT system, but they perceived little savings in terms of check-out lane productivity and operating costs.

In the pre-implementation wave, participating retailers were asked to describe what they thought would be the major benefits and drawbacks of the new off-line EBT system. In the post-implementation interview, they were asked to describe what they perceived to have been the major benefits and drawbacks of the system. (See Exhibit 2-1.) Some of the most frequently

mentioned benefits, among all retailers in the pre-implementation wave, were those related to reductions in food stamp fraud or diversion: "Cut down on fraud", and "Not as much selling of food stamps". In the post-implementation wave, the most frequently mentioned benefits once again included food stamp fraud reduction as well as the reduction of time required for handling activities: "Cut down on fraud", "Cut down handling time", "Don't have to go to bank", "Less paperwork", and "No need to stamp coupons".

Exhibit 2-1

**RETAILER PERCEPTIONS
BENEFITS OF OFF-LINE EBT SYSTEM**

	All <u>All Store</u>		Super <u>Markets</u>		Grocery <u>Stores</u>		Convenience <u>Stores</u>		Other <u>Stores</u>	
	Pre %	Post %	Pre %	Post %	Pre %	Post %	Pre %	Post %	Pre %	Post %
Cut down on fraud	31	28	35	37	12	23	36	24	42	19
Cut down handling time	14	23	25	26	—	23	9	19	25	25
Don't have to go to bank	N/A	16	N/A	14	N/A	14	N/A	5	N/A	38
Less paperwork	N/A	16	N/A	20	N/A	9	N/A	19	N/A	13
No need to stamp coupons	N/A	14	N/A	20	N/A	18	N/A	10	N/A	—
Increase in sales	N/A	12	N/A	23	N/A	5	N/A	5	N/A	6
Won't try to buy non-food	8	11	10	9	12	14	9	10	—	13
Not as much selling of food stamps	13	6	10	3	24	5	5	10	17	13
Faster	8	2	15	6	6	—	—	—	17	—
(BASE)	(71)	(94)	(20)	(35)	(17)	(22)	(22)	(21)	(12)	(16)

Source: Retailer pre-implementation Question D1: In your opinion, what will be the major benefits of the off-line EBT system? Table includes multiple mentions. Retailer post-implementation Question D1: In your opinion, what are the major benefits of the PayEase system? Table includes multiple mentions.

BASE = Number of retailers responding.

N/A = Not Applicable

“—” Indicates less than 1 percent

In the pre-implementation wave, the most frequently mentioned anticipated drawback of the new system was that it would prevent children from using their parent's card. Retailers were concerned that parents would be reluctant to let their child shop using the EBT card, and that

they would lose business as a result. This anticipated concern proved to be groundless; no retailers mentioned it as a major drawback of the EBT system in the post-implementation wave. Other anticipated drawbacks focused on learning to use the system (both customers and employees) and experiencing system down-time. Many retailers (10 percent supermarkets, 18 percent grocery stores, 9 percent convenience stores, and 17 percent other stores) in the pre-implementation wave reported that they didn't expect any major drawbacks with the new system. In the post-implementation wave, the biggest perceived drawbacks involved the amount of time required for the off-line EBT transactions: "System too slow" and "Transactions take longer". Perceived drawbacks did differ by store type: supermarkets were more likely to have experienced difficulty helping customers to use the system, while other stores saw as a major drawback the difficulties of training employees to use the system. See Exhibit 2-2.

Exhibit 2-2

RETAILER PERCEPTIONS
DRAWBACKS OF OFF-LINE EBT SYSTEM

	All Stores		Super Markets		Grocery Stores		Convenience Stores		Other Stores	
	Pre %	Post %	Pre %	Post %	Pre %	Post %	Pre %	Post %	Pre %	Post %
System too slow	N/A	12	N/A	9	N/A	18	N/A	14	N/A	6
System down time/mistakes	13	6	15	6	12	14	14	5	8	--
Transactions take longer	N/A	11	N/A	11	N/A	5	N/A	24	N/A	--
Training the customer to use the system	7	9	10	20	12	--	5	5	--	--
Hard to train employees on new system	13	3	10	9	--	--	14	--	33	--
Operating the new system	8	1	15	--	12	5	5	--	--	--
Kids won't be able to use card	18	--	10	--	24	--	23	--	17	--
No drawbacks	13	--	10	--	18	--	9	--	17	--
(BASE)	(71)	(94)	(20)	(35)	(17)	(22)	(22)	(21)	(12)	(16)

Source: Retailer pre-implementation Question D2. What will be the major drawbacks of the new Off-line EBT system? Table includes multiple mentions. Retailer post-implementation Question D2. What are the major drawbacks of the PayEase system? Table includes multiple mentions.

BASE = Number of respondents.

N/A = Not applicable

-- Indicates less than 1 percent

EBT System Impacts

Consistent with the retailers' pre-implementation expectation that the major benefit of the system would be fraud reduction (few retailers mentioned improved productivity as an expected

benefit), most retailers expected that the new system would have little impact on their check-out lane productivity and operating costs. Approximately three-quarters of grocery store, convenience store and other store retailers (71 percent, 73 percent, 83 percent, respectively) believed that their check-out lane productivity would remain the same under the new system. In contrast, 70 percent of supermarket retailers believed that their check-out lane productivity would increase. The majority of retailers in all store types (65 percent supermarkets, 71 percent grocery stores, 77 percent convenience stores, 92 percent other stores) believed that their operating costs would remain the same with the new off-line EBT system. See Exhibit 2-3.

While many retailers in the post-implementation wave perceived that EBT reduced handling time, they perceived an offsetting increase in the amount of time required for system transactions and training employees. The net result is that the majority of retailers in all store types (52 percent supermarkets, 73 percent grocery stores, 88 percent convenience stores, 94 percent other stores) perceived that their total operating costs remained the same with the off-line EBT system. The retailers' expectations of the impact of the off-line system on operating costs did not necessarily coincide with the actual reported impact of the system (See sections below on *Estimated Handling and Reconciliation Costs*, *Estimated Training Costs*, and *Estimated Food Stamp Reshelving Costs*.)

Exhibit 2-3

**RETAILER PERCEPTIONS
OFF-LINE EBT EFFECTS ON STORE OPERATIONS**

	All Stores		Super Markets		Grocery Stores		Convenience Stores		Other Stores	
	Pre %	Post %	Pre %	Post %	Pre %	Post %	Pre %	Post %	Pre %	Post %
Checkout Lane Productivity										
<i>Improve/improved</i>										
Improve/improved	32	12	70	13	24	9	14	8	17	19
Decline/declined	7	35	5	29	6	50	14	0	--	9
Same	61	53	25	58	71	41	73	52	83	63
Operating Costs										
<i>Higher/increased</i>										
Higher/increased	10	11	5	19	12	9	18	8	--	--
Lower/decreased	11	14	25	29	18	14	--	--	--	6
Same	75	73	65	52	71	73	77	88	92	94
Don't know	4	2	5	--	--	5	5	4	8	--
Total Sales										
<i>Lower</i>										
Lower	17	14	5	--	12	3	41	16	--	25
Higher	27	24	45	32	24	18	5	24	42	19
Same	52	57	50	65	53	45	50	60	58	56
Don't know	4	4	--	3	12	14	5	--	--	--
Store Profits										
<i>Increase/increased</i>										
Increase/increased	17	17	35	35	--	--	5	12	33	13
Decrease/decreased	6	7	--	3	--	9	14	4	8	19
Same	74	71	65	61	94	82	77	76	58	69
Don't know	3	4	--	--	6	9	5	8	--	--
(BASE)	(71)	(94)	(20)	(31)	(17)	(22)	(22)	(25)	(12)	(16)

Source: Pre-implementation and post-implementation retailer survey questions: In your opinion, what effect do you think the PayEase system (will have/has had) on ... Do you think (productivity/operating costs/total sales/store profits) (will/have) ...

BASE = Number of respondents.

-- Indicates less than 1 percent.

Retailers were also asked to evaluate the impact of off-line EBT on three other areas of store operations -- check-out lane productivity, total sales, and store profits. Retailer expectations about the impact on check-out lane productivity were more optimistic than their subsequent perception of off-line EBT's effect. In the pre-implementation wave, approximately one-third (32 percent) of the retailers anticipated that off-line EBT would improve check-out lane productivity, almost two-thirds (61 percent) believed that check-out lane productivity would remain the same, and fewer than one in ten (7 percent) anticipated a decline. In the post-implementation wave, only one in ten (12 percent) retailers perceived that their check-out lane productivity had increased. Approximately one-third (35 percent) of the retailers reported that their check-out lane productivity had decreased, and one-half (53 percent) reported that it had remained the same.

In the evaluation of the state-initiated, on-line systems, retailers were asked the same series of questions about the impact of EBT on store operations. Overall, the retailers' perceptions of the impact of EBT on their operations were very similar for both the on-line and off-line systems. The most frequent retailer response was that operating costs, total sales, and store profits remained the same under EBT (among both on-line and off-line retailers). However, there were some differences in retailer perceptions between the two evaluations. More on-line retailers reported that operating costs increased with EBT (off-line 11 percent, on-line: 24 percent New Mexico, 23 percent Ramsey County), while off-line retailers more frequently judged EBT and coupons to be no different in terms of operating costs (off-line 73 percent, on-line: 43 percent New Mexico, 56 percent Ramsey County). This difference in operating costs could be due, at least in part, to the difference in equipment costs between the on-line and off-line demonstrations. All equipment and telecommunications were free to retailers in the off-line demonstration; however, due to an existing POS infrastructure in New Mexico, some stores in that on-line demonstration chose to continue using their third party processors, therefore incurring equipment or usage fees associated with this linkage. See Exhibit 2-4.

Exhibit 2-4

**RETAILER PERCEPTIONS
OFF-LINE EBT EFFECTS ON STORE OPERATIONS
(Comparison With On-line Systems)**

	<u>Off-line</u> Montgomery County	<u>On-line</u>		Ramsey County
		New Mexico		
<u>Operating Costs</u>				
Increased	11	24		23
Decreased	14	31		8
Same	73	43		56
Don't know	2	2		13
<u>Total Sales</u>				
Higher	24	45		26
Lower	14	1		2
Same	57	52		61
Don't know	4	2		11
<u>Store Profits</u>				
Increased	17	20		15
Decreased	7	1		11
Same	71	71		60
Don't know	4	8		14
<u>Food Stamp Fraud</u>				
Increased	0	1		3
Decreased	69	81		70
Same	29	16		27
Don't know	2	3		0
(BASE)	(94)	(44)		(43)

Source: Post-implementation retailer survey questions: In your opinion, what effect do you think the PayEase system (will have/has had) on ... Do you think (productivity/operating costs/total sales/store profits) (will/have) ...

BASE = Number of retailers responding.

Perceptions of EBT effects on total sales were very similar for the two systems, although on-line retailers were more likely to report that EBT had increased total sales (24 percent off-line, on-line: 45 percent New Mexico, 26 percent Ramsey County). Similarly, perceptions of the impact of EBT on store profits showed few differences. Most retailers (71 percent off-line, on-line: 71 percent New Mexico, 60 percent Ramsey County) perceived that profits remained the same after the switch from coupons to EBT.

The one area where EBT was perceived to have had a substantial positive impact was in reducing food stamp fraud and abuse. Retailers in both the off-line and on-line evaluations perceived that EBT had reduced fraud and abuse of the food stamp system (69 percent off-line, on-line: 81 percent New Mexico, 70 percent Ramsey County).

Ease of Off-line EBT System Usage

Retailers in both the pre-implementation and post-implementation interviews were asked to compare the ease of using the off-line EBT and paper systems. In the pre-implementation interview, retailers were asked about their *expectations*: Would the off-line EBT system be easier or harder than the current coupon system? In the post-implementation interview retailers were asked about their *experiences*: Had the off-line EBT system been easier or harder than the paper coupon system?

In the pre-implementation interview, the most frequent response, for all store types except other stores, was that the off-line EBT system would be "a lot" easier than the coupon system (55 percent supermarkets, 47 percent grocery stores, 32 percent convenience stores, 33 percent other stores). Most other stores expected that the two systems would be about the same (42 percent). Few retailers in the pre-implementation expected that off-line EBT would be harder than the coupon system. One exception to this is convenience stores. Almost one-quarter (23 percent) of convenience stores expected that off-line EBT would be either "somewhat" or "a lot" harder than the coupon system. This compares to five percent for supermarkets, six percent for grocery stores, and none for other stores. It is unclear why convenience stores had such relatively negative expectations for the EBT system. It could have been due to a number of factors: the

low volume of food stamp redemptions in convenience stores; the more compact (and often more cluttered) cashier areas in convenience stores; or some other factor. See Exhibit 2-5.

Exhibit 2-5					
EASE OF OFF-LINE EBT SYSTEM USAGE					
	<u>All Stores</u> <u>%</u>	<u>Super Markets</u> <u>%</u>	<u>Grocery Stores</u> <u>%</u>	<u>Convenience Stores</u> <u>%</u>	<u>Other Stores</u> <u>%</u>
A lot easier than coupon					
Pre-implementation	42	55	47	32	33
Post-implementation	27	32	27	16	31
Somewhat easier than coupon					
Pre-implementation	17	25	—	18	25
Post-implementation	19	19	23	20	13
About the same as coupon					
Pre-implementation	28	15	41	23	42
Post-implementation	31	32	14	36	44
Somewhat harder than coupon					
Pre-implementation	8	5	6	18	—
Post-implementation	12	13	14	12	6
A lot harder than coupon					
Pre-implementation	1	—	—	5	—
Post-implementation	11	3	18	16	6
Don't know					
Pre-implementation	3	—	6	5	—
Post-implementation	1	—	5	—	—
(BASE)					
Coupon	(71)	(20)	(17)	(22)	(12)
Off-line EBT	(94)	(31)	(22)	(25)	(16)

Source: Retailer pre-implementation and retailer post-implementation Question D3. In your opinion, other than in the initial training, has the PayEase system been easier or harder for you to deal with than the coupon system? Would you say the PayEase system has been ...?

BASE = All participating retailers, for questions involving perceptions of the system.

“—” Indicates less than 1 percent

In the post-implementation interview, retailer evaluations of the ease of system usage had changed substantially. Overall, the off-line EBT system was perceived by the retailers as harder to use than the coupon system. Retailers who thought EBT was harder to use cited "more time consuming for the cashier" and "more time consuming for the customer" as the reasons the system was harder to use. Although many retailers continued to view the EBT system as easier than the coupon system (27 percent a lot easier, 19 percent somewhat easier), an increased number of retailers found the off-line EBT system to be harder than coupons. In the pre-implementation, only nine percent of the retailers expected that the off-line EBT system would be "somewhat" or "a lot" harder. However, in the post-implementation wave, almost one-quarter (23 percent) reported that the off-line EBT system was "somewhat" or "a lot" harder for them to use than the paper coupon system had been. This change is particularly apparent among grocery stores, with six percent in the pre-implementation wave reporting an expectation that EBT would be more difficult to use, and 32 percent in the post-implementation wave reporting that EBT had been more difficult to use. Convenience stores remained relatively constant in their assessment of the ease of usage, with 23 percent in the pre-implementation and 28 percent in the post-implementation reporting expected or actual use of EBT to be harder than coupons. Computer and system response time may explain some of the difficulty in using the EBT system. In addition to being viewed as time consuming, both for the cashier and the customer, many retailers reported that they had experienced difficulties with the computer which had prevented them from performing the settlement transaction. Almost two-thirds (63 percent) reported that this had happened at least once in the past three months. More than one-third (39 percent) of these retailers said that this had created a "major problem" for them. However grocery stores were no more likely than other types of stores to report this problem.

The differences between expected and actual ease of using the off-line EBT system could cause retailers to become dissatisfied with the system, and if the dissatisfaction were extreme enough, some retailers could leave the program. This has not been a problem with the current demonstration, and may not cause problems in future. However, this concern could be reduced by presenting a balanced representation of the system in the introduction of future EBT programs — describing benefits, but also acknowledging that there may be a period of system "fine tuning."

Overall, it appears that retailers have accepted the off-line EBT system as a way of handling food stamp benefits, albeit not as enthusiastically as retailers in other demonstrations. For example, retailers in the evaluation of the state-initiated, on-line EBT systems preferred EBT as a method for delivering food stamp benefits (72 percent prefer EBT, 28 percent prefer coupon). However, it should be noted that the question was framed differently in the state-initiated, on-line evaluation. Retailers were simply asked which system they preferred: the EBT system or food stamp coupons.

Intent to Continue With Off-line EBT Program

Another measure of retailer perceptions of the off-line EBT system is their intent to remain in the program should the state decide to continue PayEase. (See Exhibit 2-6) This question was asked of retailers in the post-implementation interview. The vast majority of retailers report that they would continue to participate if the state continues the PayEase program (100 percent supermarkets, 95 percent grocery stores, 88 percent convenience stores, 94 percent other stores). The relatively low level of enthusiasm among convenience stores could be a function of the lower volume of food stamp transactions that they regularly process. In the small convenience stores, the costs to the retailer of participating in the system, such as training and reconciling (although these costs are not fixed, there is a minimum cost required to operate the off-line system, regardless of whether the retailer has a monthly redemption of \$1 or \$1,000) are supported by a smaller base of food stamp redemptions. This difference in food stamp redemption base could make the system appear more expensive to the convenience store retailers than it does to other retailers.

Preference for On-line vs. Off-line Systems

A small number of retailers currently have an on-line point-of-sale (POS) system in their store in addition to the off-line EBT system. In the post-implementation interview, these retailers were asked about their preferences for using the two systems. Although care should be exercised when drawing conclusions based on these results, it is important to take this opportunity to examine this direct comparison between the two systems.

The majority of retailers in both store types prefer using the on-line POS system. However, this preference is more extreme among convenience stores. The reasons given by the retailers for their preferences are fairly similar. Among retailers who prefer the off-line system, most say that it is "faster," followed by "it is easier" than their on-line system. Retailers who prefer on-line most frequently say that "it is easier," followed by "faster."

Exhibit 2-6

RETAILER INTENT TO CONTINUE WITH OFF-LINE EBT

	All <u>Stores</u> <u>%</u>	Super Markets <u>%</u>	Grocery Stores <u>%</u>	Convenience Stores <u>%</u>	Other Stores <u>%</u>
Will participate if state continues PayEase	95	100	95	88	94
Will not participate in PayEase	5	--	5	2	6
(BASE)	(94)	(31)	(22)	(25)	(16)

Source: Retailer post-implementation Question D11. Based on your experience with PayEase, if the state decides to continue the program will you continue to participate in the PayEase program?

BASE = Number of retailers responding.

-- Indicates less than 1 percent

CHECK-OUT PRODUCTIVITY COSTS

When EBT replaces coupons as the medium of exchange, it may affect the productivity of the check-out counter, both in terms of time per food stamp transaction and in the skill or proficiency levels required of the check-out staff. If the EBT transaction takes longer than coupons for comparable transactions, then EBT will impose additional costs on the retailer for participating in the FSP. Any additional time required to process food stamp transactions is

absorbed by the retailer as the opportunity cost of the cashier's time and will be valued at the wage rate of the cashier. If the cumulative additional time across many transactions is great enough, the retailer will have to provide additional cashiers to keep lines from growing long. An important objective of the evaluation was to assess how much additional time is required for transactions involving EBT compared to cash transactions, and to compare the EBT increments to those of food stamp coupons and on-line EBT systems.

Transaction time includes three phases: ringing up items on the register to reach a total sale amount; payment, which includes the interval from the time the sale total is shown on the register until the cashier has taken payment, given change, and cleared the register; and bagging/receipt printing, which extends until all items are bagged and the customer has received a printed receipt. The entire interval from the beginning of ringing to the end of bagging and the handing of a receipt is of interest in this analysis, because the time needed to conduct the EBT transaction may be spread across the phases and may occur while other parts of the transaction are occurring. To the extent that EBT processing takes place simultaneously with other activities, it will not add to the total time. If, however, other parts of the transaction sequence cannot take place until EBT processing is complete, then the total transaction time may be lengthened substantially by the switch to EBT. Each phase of the transaction is of interest and needs to be timed separately.

Some types of stores may be more effective than others in organizing the work at the check-out lanes to minimize the impact of EBT on transaction time. Therefore, the effects of the payment mode on transaction time may depend on the type of store. The effects may also differ across weeks of the month as a function of the frequency of transactions. When stores are very busy with food stamp transactions during the week of issuance, there should be little slack time at check-out lanes and cashiers should be motivated to process the customers efficiently to keep lines from growing too long. The evaluation assessed the effects of EBT during these peak periods of the month. The timing of the observations had the dual benefit of timing transactions during a period when the greatest volume of food stamp transactions could be observed, and when efficiency is very important (because of the high volume of transactions). At other times of the month, there are fewer transactions, and cashiers may be more leisurely in checking out customers.

For all analyses of the impacts on transaction times, it is necessary to control a broad set of transaction attributes that can affect the duration of the transaction. Examples of these attributes are: the number of items purchased, weighing produce, obtaining price checks on items, replacing damaged items, and damaged/unreadable benefit cards.

Analysis

A separate analysis was done for each store type and for all stores together. The analyses produced mean total transaction times for each payment mode, adjusted for the covariates in the model. Differences between means for payment modes involving food stamp coupons or EBT and those involving cash only were computed to find the incremental time added by acceptance of payment using food stamp benefits. The incremental time was multiplied by the loaded wage rate for cashiers in each retailer category and standardized to estimate the cost per thousand dollars of food stamp benefits redeemed. See Appendix B for a more detailed description of the analysis.

Effects of Payment Mode on Transaction Times

Exhibit 2-7 displays the estimated mean transaction times for each of the modes of payment observed, adjusted for other characteristics of the transactions. Exhibit 2-8 summarizes the differences of interest for the three store types and for all stores considered together.

Exhibit 2-7

**EFFECTS OF PAYMENT MODE ON
TRANSACTION TIME**

**Total Time in Seconds
Means Adjusted for Covariates**

<u>Payment Modes</u>	<u>Store Type</u>			
	<u>All Stores</u>	<u>Supermarket</u>	<u>Grocery</u>	<u>Convenience</u>
Cash only	48.8	86.4	44.2	30.1
Check only	78.4	134.8	72.3	--
Food stamps only	52.0	97.5	47.9	28.8
Off-line EBT only	78.2	114.9	79.1	58.6
Cash, coupons ^a	61.2	104.9	56.6	--
Cash, food stamps	74.8	132.9	66.3	45.9
Cash, food stamps, coupons ^a	78.7	136.2	--	--
Check, coupons ^a	79.6	138.7	--	--
Food stamps, coupons ^a	71.3	125.5	62.1	--
Off-line EBT, cash	80.1	130.9	77.7	--
Off-line EBT, coupons ^a	--	--	--	--

Note: ^a Coupons refer to manufacturers cents-off coupons.

Source: Check-out counter observations, Dayton, November - December, 1991. November - December, 1992. Refer to Appendix B.

"--" Indicates a payment mode not observed or insufficient observations. Cells with fewer than 15 observations are not displayed.

Exhibit 2-8

**EFFECTS OF PAYMENT MODE ON
TRANSACTION TIME**

**Difference in Total Transaction Time
(Seconds)**

<u>Payment Modes Compared</u>	Store Type			
	<u>All Stores</u>	<u>Supermarket</u>	<u>Grocery</u>	<u>Convenience</u>
Food stamps only - Cash only	3.2 ^a	11.1 ^b	3.7 ^a	-1.4
Food stamps, cash - Cash only	26.0 ^b	46.5 ^b	22.1 ^b	15.8 ^c
Food stamps, coupons ^c - Cash, coupons ^c	10.1	20.7	5.4 ^c	--
Off-line EBT, only - Cash only	29.4 ^b	28.5 ^b	34.9 ^b	28.4 ^b
Off-line EBT, cash - Cash only	31.3 ^b	44.5 ^b	33.5 ^b	50.9 ^c
Off-line EBT, coupons ^c - Cash, coupons ^c	-0.3	2.6	--	--
Weighted food stamps-Cash ^d	7.8	21.1	6.8	0.5
Weighted Off-line EBT-Cash	29.1	31.7	34.6	29.0

Notes: ^a Statistical significance: $p < .001$

^b Statistical significance: $p < .0001$

^c Statistical significance: $p < .05$

^d Weighted differences were estimated by weighing each combination of payment modes by its observed frequency, summing the products separately for food stamps and off-line EBT, and dividing each sum by the sum of its weights.

* Coupons refer to manufacturers cents-off coupon.

Source: Check-out counter observations, Dayton, November - December, 1991. November - December, 1992.

-- Indicates a payment mode not observed or insufficient observations. Cells with fewer than 15 observations are not displayed.

The weighted average of all paper food stamp transactions was 7.8 seconds longer than comparable cash transactions across all stores. The difference between food stamps and cash was greatest in supermarkets (21.1 seconds) and least in convenience stores (0.5 second). The greater efficiency of convenience stores in accepting payment in food stamps may result from numerous low dollar purchases made with loose one-dollar food stamp coupons, much like cash. By comparison, in supermarkets where recipients make larger purchases, food stamps are typically presented in coupon books from which the cashier must find and tear out coupons of appropriate denominations and make change in one-dollar food stamp coupons and coins.

Weighted average off-line EBT transactions across all stores were 29.1 seconds longer than comparable cash transactions, and ranged from 34.6 seconds in grocery stores to 29.0 seconds in convenience stores. Relative to paper food stamps, EBT transactions took from 10.6 seconds longer in supermarkets to 28.5 seconds longer in convenience stores.

In supermarkets, the effect of paying with food stamp coupons on the length of transactions was 11.1 seconds for pure food stamp payments versus cash only, 20.7 seconds for food stamps and cents-off coupons versus cash and cents-off coupons (not statistically significant), and 46.5 seconds for food stamps and cash versus cash only. The weighted average of all transactions involving food stamp coupons was 21.1 seconds longer than cash transactions. For comparison, payment by check took, on average, 43.4 seconds longer than cash transactions.

Off-line EBT transactions in supermarkets took 28.5 seconds longer than cash transactions when no other payment modes were involved. Transactions involving off-line EBT combined with cash or cents-off coupons took longer than cash transactions by 44.5 seconds and 2.6 seconds, respectively, although the latter was not statistically significant. The weighted average of all off-line EBT transactions was 31.7 seconds longer than comparable cash transactions.

In grocery stores, payment by food stamp coupons increased transaction time by 3.7 seconds when compared to cash only purchases; payment by food stamps and cents-off coupons added 5.4 seconds; and payment by food stamps and cash added 22.1 seconds. The weighted average of food stamp transactions was 6.8 seconds longer than cash transactions. Checks, by comparison, added 27.9 seconds to transaction time.

Off-line EBT transactions in grocery stores took 34.9 seconds longer than payment by cash alone. Payment by off-line EBT and cash added 33.5 seconds. The weighted average of all EBT transactions was 34.6 seconds longer than the weighted average of all cash transactions.

In convenience stores, payment by food stamps and cash increased transaction time by 15.8 seconds. Off-line EBT took 28.4 seconds longer than cash, and payments by EBT and cash took 50.9 seconds longer. The weighted average of food stamp transactions was about the same as cash (0.5 seconds longer) while weighted average EBT transactions took 29 seconds longer than cash. Other differences involving food stamps or off-line EBT were not statistically significant.

Effects of Payment Mode on Cost

The impact on check-out costs of retailers' accepting payment by paper food stamps or off-line EBT is shown in Exhibit 2-9. The cost estimates all compare payment by food stamps or EBT, alone or in combination with other payment modes, against payment by cash. Estimates are based on the loaded full-time cashier wages in each of the store types. The column labeled "Raw" expresses the cost as the product of the incremental time of transactions involving a payment mode and the labor rate. That represents the opportunity cost of the cashier's time taken by more time-consuming payment modes and implicitly assumes that the longer transactions always displace valuable alternative uses of the cashiers' time. The column labeled "Adjusted" takes into account the proportion of transactions for which no other customers are waiting and for which the additional time could be considered to come out of slack. That is based on the assumption that cashiers would engage in no valued activity while waiting for the next customer. These two columns bracket the range of approaches that might be taken in placing value on the transaction time. A "best" estimate might be the middle of the range. All costs are expressed in standard form as cost per thousand dollars of food stamp benefits redeemed.

Exhibit 2-9

**EFFECTS OF PAYMENT MODE ON
CHECKOUT COSTS**

Cost Per \$1,000 Food Stamp Redemptions*

	All Stores		Supermarket		Store Type			
	Raw	Adjusted ^b	Raw	Adjusted ^b	Raw	Adjusted ^b	Raw	Adjusted ^b
Food stamps only -								
Cash only	0.38	0.23	0.70	0.57	0.70	0.41	-0.97	-0.39
Food stamps, cash -								
Cash only	1.77	1.86	1.86	1.53	1.79	1.04	6.39	2.53
Food stamps, coupons ^c -								
Cash, coupons ^c	1.19	0.73	1.30	1.07	1.04	0.60	N/A	N/A
Weighted food stamp modes - Cash	0.80	0.49	1.14	0.94	1.05	0.61	0.33	0.13
Off-line EBT only -								
Cash only	2.10	1.30	1.10	0.90	4.28	2.48	8.77	3.48
Off-line EBT - Cash only	1.94	1.20	1.49	1.22	3.00	1.74	27.57	10.94
Off-line EBT, coupons ^c -								
Cash, coupons ^c	-.02	-.01	0.14	0.11	N/A	N/A	N/A	N/A
Weighted Off-line EBT modes - Cash only	2.01	1.40	1.18	0.97	4.03	2.34	9.05	3.59

Notes: * Cost per \$1,000 = loaded wages * (difference in seconds/3600) * (1,000/average food stamp transaction)

^b Adjusted columns are reduced by the proportion of transactions in which no customer was waiting at the end of the transaction.

^c Coupons refer to manufacturers' coupons.

Source: Check-out counter observations, Dayton, November - December, 1991. November - December, 1992.

N/A = Not applicable

Across all stores the costs of food stamp transactions averaged \$0.80 higher per \$1,000 of food stamp redemptions compared to cash transactions. EBT transactions cost more than cash transactions by \$2.01 per \$1,000 of redemptions on average. In supermarkets, the incremental costs of food stamps (\$1.14) and EBT (\$1.18) were very similar, but the patterns were quite different in grocery and convenience stores. In grocery stores the added cost of food stamp transactions was \$1.05 per \$1,000, while EBT added \$4.03 per \$1,000. In convenience stores, food stamps added \$0.33 per \$1,000, while EBT added \$9.05 per \$1,000. Adjusted to account for the percentage of transactions in which no additional customers were waiting at the end of the transaction, the incremental costs due to food stamps and EBT were smaller, especially in convenience stores where a higher proportion of transactions end with no one waiting in line to check out.

The data indicate that the cost impacts of off-line EBT are greater on grocery stores and substantially greater on convenience stores than on supermarkets per thousand dollars of benefits redeemed. The time, and hence the cost, added to each transaction by EBT is very similar across the three store types. However, in grocery stores and convenience stores, the incremental cost of transactions must be amortized over a much smaller redemption base than in most supermarkets, resulting in a higher cost per thousand dollars of redemptions.

RETAILER PRODUCTIVITY COSTS

Handling and Reconciliation Costs

Under the coupon system, food stamp handling and reconciliation costs encompass all of the activities and procedures in which the retailer engages during the time between receipt of the coupon from the food stamp recipient until the coupons are deposited and the funds are credited to the store's account. Under EBT, handling of food coupons is replaced by settlement and reconciliation, which encompass all of the activities and procedures in which the retailer engages from the time of purchase until the funds are credited to the store's bank account. The following section details the estimated costs of handling and reconciliation under both the off-line EBT and coupon systems, and summarizes the costs of these activities for the four different types of stores.

Food Stamp Coupon Activities

In the pre-implementation interview, descriptions of the handling process revealed that the coupon handling process was very individualized, varying from store to store. Some of the steps reported by the retailers included:

- counting each cash drawer at the end of each cashier shift;
- separating coupons from the cash;
- separating coupons by denomination and counting them;
- stamping/endorsing the coupons;
- bundling coupons by denomination;
- depositing coupons after receiving a sufficient quantity (some banks have a deposit minimum for coupons); and
- filling out a redemption certificate (RC) for each deposit (the RC is the retailer's food coupon deposit ticket which is provided by FNS to all authorized retailers).

Some stores also included handling steps such as "take cash drawer to supervisor", "remove coupons from cash drawer", or "security guard escorts coupon deposits to armored car". The number and complexity of handling steps reported were often related to the number of store employees, or the size of the store.

In addition, some banks may place restrictions upon food stamp deposits, which may influence the store's handling procedures. Such restrictions are a question of individual bank policy and may include minimum deposit amounts or coupon bundling requirements (coupons must be sorted by denomination and bundled in set dollar amounts). Banks are not allowed, under federal regulation, to charge retailers for food stamp deposits that are properly strapped and bundled.

EBT Activities

Under the off-line EBT system, fewer steps were involved in the handling/ reconciliation process than with the paper system. Typically, off-line EBT reconciliation involved:

- "settling" the day's transactions; and
- reconciling the settlement amount received from the EBT host with the balances of the individual store terminals.

The settlement process collects, from each of the EBT terminals in the store, all of the food stamp transactions that have taken place since the retailer last settled. The transactions are summed and transferred electronically to the EBT host. The retailer terminal prints a receipt showing the dollar value of the settlement transaction. Retailers are required to settle at least once every 24 hours.

Under the off-line EBT system, retailers have a choice of auto-settlement or manual settlement for their daily transactions. Auto-settlement allows the retailer to select a regular time (day or night -- the store does not need to be open), and the host computer will automatically initiate settlement. The second option is manual settlement which allows retailers to settle whenever they would like. Manual settlement can be initiated only by a store manager. Before either manual or auto-settlement can be performed, the retailer must run an "end of day transaction" on each store terminal. This transaction collects all of the day's transactions in preparation for electronic transfer and prints out a receipt to aid the retailer in reconciliation. After the system settlement is completed, the retailer reconciles the EBT system receipt with the balances from the individual store registers.

Methodology for Determining Handling and Reconciliation Costs

Retailers were asked to estimate the amount of time required by each type of employee that is involved in the food stamp handling process and to provide wage rate information for each of these employee types. Any missing wages were imputed within store categories by using a "hot deck" procedure, which randomly selects an actual wage rate for that type of employee to

replace the missing value. Missing wage rates occurred almost exclusively among owners and managers.

Six stores (two grocery stores, two convenience stores and two other stores) reported food stamp handling times that were extreme enough to be labeled outliers. (See Appendix C for a listing of the outlying values). Because of the substantial impact on the mean handling cost of these outlying values, handling costs were calculated both with the outlying values included and with those values removed. After examining the outlying values, it was determined that the appropriate action was to exclude those values from further analysis. The following tables report on the handling costs with the outlying values excluded.

Handling costs were also standardized to represent the cost per \$1,000 of each store's food stamp redemptions. Further, the average cost for each store type represents a weighted average, where each store's handling cost is weighted by that store's redemption volume relative to the total volume for other stores in the store type.

Retailer handling/reconciliation activities were measured by self-report. In general, pre-implementation handling activities (including reconciliation) were called handling costs because of the physical activity with the food stamp coupons. Post-implementation activities were called reconciliation costs. The difference between the two is that reconciliation costs reported in the post-implementation do not include any physical handling, sorting or bundling of the coupons.

Estimated Handling and Reconciliation Costs

Food stamp coupon handling costs, when examined by type of store, show strong economies of scale. Handling costs ranged from \$9.83 per \$1,000 of redeemed benefits in supermarkets, which have the highest average monthly redemption volume (\$79,318), to \$50.60 per \$1,000 of redeemed benefits in convenience stores, which have the lowest average redemption volume (\$2,681). The economies of scale may be attributable to the variety of steps the employee must go through to record and process food stamp coupons, regardless of the number of food stamps received. Detailed results are presented in Exhibit 2-10.

A similar pattern of costs was found in the post-implementation data, with supermarkets having \$73,320 in EBT redemptions and reconciliation costs of \$3.75 per \$1,000 of redemptions, and convenience stores having \$1,938 in EBT redemptions and reconciliation costs of \$20.87 per \$1,000 of redemptions. Although the costs follow the same pattern across store types, as in the pre-implementation, the magnitudes of the costs are substantially different. The average handling cost in the pre-implementation was \$12.93 per \$1,000 of redemptions, and in the post-implementation wave the average reconciliation cost had decreased to \$4.46 per \$1,000 of redemptions. This difference in savings of approximately \$8.50 per \$1,000 of redemptions may be attributable to the differences in procedures involved in handling and reconciling coupon and EBT transactions. Food stamp coupons must be counted with drawer receipts, sorted by denomination, and bundled and strapped before the benefits can be deposited at the retailer's bank. These labor-intensive steps are not necessary under the EBT system.

Exhibit 2-10

**RETAILER FOOD STAMP HANDLING* AND
RECONCILIATION COSTS
(By Type of Store)**

	<u>All Stores</u>	<u>Super Markets</u>	<u>Grocery Stores</u>	<u>Convenience Stores</u>	<u>Other Stores</u>
Average handling/reconciliation time (hours/month)					
Coupon	44.10	78.68	42.58	22.26	23.14
EBT	12.00	27.03	5.74	4.96	6.59
Average wage (dollars per hour)					
Coupon	\$8.07	\$9.91	\$7.60	\$6.77	\$7.80
EBT	\$8.53	\$8.42	\$8.28	\$9.06	\$8.12
Average handling/reconciliation cost/store/month^b					
Coupon	\$384.54	\$779.45	\$323.43	\$150.74	\$180.52
EBT	\$101.51	\$227.68	\$47.52	\$44.94	\$53.50
Average handling/reconciliation cost per \$1,000 benefits redeemed^c					
Coupon	\$12.93	\$9.83	\$23.18	\$50.60	\$25.49
EBT	\$4.46	\$3.75	\$5.68	\$20.87	\$9.07
EBT-Coupon difference	-\$8.47	\$6.08	-\$17.50	-\$29.73	-\$16.42
 Number of stores (coupon & EBT)					
	67	20	16	20	11
Average store redemption					
Coupon	\$28,644	\$79,318	\$13,025	\$2,681	\$6,436
EBT	\$25,094	\$73,320	\$7,321	\$1,938	\$5,361

Notes: * Anomalous pre-implementation handling data which could not be resolved were removed from the pre-implementation coupon analysis.

^b Average cost per store per month was derived by multiplying handling time and loaded wage rate for each store, then averaging by store type.

^c Cost per \$1,000 of benefits (food stamp coupons in pre-implementation, EBT in post-implementation) redeemed represents a weighted average of individual store ratios of cost to \$1,000 of benefits redeemed at the store. Each store cost ratio is weighted by the store's redemption volume relative to total volume for other stores in the store type.

Source: Retailer pre-implementation and retailer post-implementation Questions B3a-B3c: Staff members, wages and time required to handle food stamps/reconcile PayEase.

Exhibit 2-11 presents comparative results from the off-line and state-initiated on-line system evaluations. When compared to previous on-line demonstrations, retailers in the off-line system evaluation reported lower reconciliation costs per \$1,000 of benefits redeemed (\$4.46 off-line vs. on-line: \$6.14 New Mexico, \$20.08 Ramsey County). The evaluation of the on-line demonstrations¹ suggests that the difference in reconciliation costs between the two locations may be due to economies of scale between the two locations -- the amount of effort required to reconcile each EBT terminal is the same regardless of the dollar value of food stamp redemptions. A similar argument may hold true in the off-line demonstration. Retailers in the Montgomery County demonstration area experienced redemption levels more similar to those reported in New Mexico than to those of Ramsey County.

¹ John A. Kirlin, et al., The Impacts of the State-Initiated EBT Demonstration on the Food Stamp Program, Cambridge, Massachusetts: Abt Associates Inc., June, 1993.

Exhibit 2-11

**RETAILER FOOD STAMP HANDLING^a AND RECONCILIATION COSTS
(Off-line vs. On-line Systems)**

	<u>Off-line</u> <u>Montgomery</u> <u>County</u>	<u>On-line</u> <u>New</u> <u>Mexico</u>	<u>On-line</u> <u>Ramsey</u> <u>County</u>
Average handling/reconciliation cost/store/month ^b			
Coupon	\$384.54	\$129.33	\$ 80.60
EBT	\$101.51	\$108.00	\$ 85.55
Average handling/reconciliation cost per \$1,000 benefits redeemed ^c			
Coupon	\$12.93	\$15.80	\$ 37.74
EBT	\$4.66	\$6.14	\$ 20.08
EBT-Coupon Difference	-\$8.47	-\$9.44	-\$178.66
Number of stores (coupon & EBT)	67	44	43
Average store redemption			
Coupon	\$28,644	\$16,328	\$2,707
EBT	\$25,094	\$34,497	\$5,619

Notes: ^a Anomalous pre-implementation handling data which could not be resolved were removed from the Montgomery County pre-implementation coupon analysis.

^b Average cost per store per month was derived by multiplying handling time and loaded wage rate for each store, then averaging by store type.

^c Cost per \$1,000 of benefits food stamp coupons in pre-implementation, off-line EBT in post-implementation redeemed represents a weighted average of individual store ratios of cost to \$1,000 of benefits redeemed at the store. Each store cost ratio is weighted by the store's redemption volume relative to total volume for other stores in the store type.

Source: Retailer pre-implementation and retailer post-implementation Questions B3a-B3e: Staff members, wages and time required to (handle food stamps/reconcile PayEase).

Store Training Costs

Food Stamp Coupon Activities

The FSP imposes restrictions on who may use the food stamp coupons, and how change can be given in food stamp transactions. Further, food stamp regulations restrict the use of coupons to food purchases, and prohibit retailers from engaging in procedures that discriminate against food stamp customers. All new cashiers must be trained on these procedures. When retailers are first authorized to become part of the FSP, they receive a set of training materials from their FNS Field Office, including a pamphlet describing items that are eligible for food stamp purchase. This pamphlet can be distributed to new cashiers. In addition to food stamp regulations, new cashiers must be trained on the special procedures for handling a food stamp transaction (see previous section).

Off-line EBT Activities

Training to handle food stamp transactions under the off-line EBT system covers many of the same areas as food stamp coupon training. New cashiers must still be trained to recognize which items are eligible for food stamp purchase, to verify the identity of the food stamp recipient, and not to discriminate against food stamp customers. Employees are trained in the use of the equipment for the off-line EBT transactions, and the procedures for processing transactions if the system goes down. Employees must also be trained on those activities specifically related to settling and reconciling off-line EBT transactions.

Methodology for Determining Training Costs

Training costs were calculated individually on a store-by-store basis and then averaged across store type. Retailers were asked to report the amount of time required for food stamp and EBT training when they hire a new checkout clerk. In order to compensate for any changes in turnover, the wage rate and number of employees trained were held constant across waves, with only the amount of time spent actually training each employee varying.

Training costs were also standardized to represent the cost per \$1,000 of each store's total food stamp redemptions. The training costs were allocated across total food stamp redemptions within the demonstration area (electronic and paper coupons) because cashiers must be trained to process and handle both EBT and coupon transactions. The average training cost for each store type represents a weighted average, where each store's training cost is weighted by that store's redemption volume relative to the total volume for other stores in the store type.

Reported training costs represent the ongoing costs of training an employee about FSP regulations and to use the EBT equipment. These costs do not reflect the one-time only initial training costs required to implement the EBT system. While these represent considerable cost, when amortized over the lifetime of the system the amount that the initial training cost adds to the overall participation costs becomes very small in comparison.

The training costs reported below include stores that report having no ongoing training costs. This situation can occur if a store reports that they rarely or never hire a new cashier (or other person to handle checkout). This happens most frequently in small family-run grocery or other-type stores. It is also possible for a store to report zero training costs if their volume of food stamp redemptions is so low that the store chooses not to train new hires on food stamp procedures.

Estimated Training Costs

With the exception of other stores, food stamp training costs in both the pre-implementation and the post-implementation wave also exhibit an economy of scale, with supermarkets reporting one of the lowest average training costs per \$1,000 of benefits redeemed (\$5.98 pre-implementation, \$3.67 post-implementation) and convenience stores reporting the highest (\$13.68 pre-implementation, \$4.88 post-implementation). Because a store must train its new employees on the entire food stamp procedure, regardless of the number of food stamp transactions they are likely to encounter, stores that do a large volume of food stamp redemptions experience greater training economies. Other stores are an exception because they have so few new hires each month (0.0 full time cashiers in both the pre-implementation and post-

implementation, 0.1 part time cashiers in the pre-implementation, 0.4 part time cashiers in the post-implementation wave) that training cost is minimal. See Exhibit 2-12.

When compared to previous on-line demonstrations, retailers in the off-line system evaluation reported average training costs per \$1,000 of benefits redeemed in between the training costs reported in the two previous demonstration locations (\$2.91 off-line versus on-line: \$1.87 New Mexico, \$5.41 Ramsey County).¹

Reshelving Costs

Sometimes, (for a variety of reasons) some or all of the items the recipient intended to purchase need to be returned to the shelves. Food stamp recipients in particular may have this difficulty, either because they select an ineligible item or they have insufficient benefits. Therefore, reshelving costs are a cost to the retailer that must be considered when evaluating the costs and benefits of a new food stamp delivery system such as off-line EBT.

¹ Kirlin, op. cit.

Exhibit 2-12

RETAILER FOOD STAMP TRAINING COSTS

	<u>All Stores</u>	<u>Super Markets</u>	<u>Grocery Stores</u>	<u>Convenience Stores</u>	<u>Other Stores</u>
Average new hires (per month)					
Full-time	1.13	2.00	1.00	1.00	.00
Part-time	1.80	2.80	1.80	1.25	.40
Average training time (hours per hire)					
Coupon	4.24	3.52	5.01	2.39	7.82
Off-line EBT	1.37	1.86	1.48	0.67	1.57
Average trainer time (hours per hire)					
Coupon	4.74	3.52	6.17	2.99	7.82
Off-line EBT	2.06	1.92	2.96	1.12	3.45
Average cashier training wage	\$4.57	\$4.64	\$4.39	\$4.50	\$4.84
Average trainer wage	\$11.97	\$16.46	\$4.28	\$17.07	\$6.74
Average training cost/store/month ^a					
Coupon	\$200.93	\$365.29	\$142.42	\$141.75	\$94.79
Off-line EBT	\$92.63	\$197.76	\$55.70	\$50.56	\$31.70
Cost/\$1,000 of benefits redeemed ^b					
Coupon	\$6.32	\$5.98	\$3.65	\$13.68	\$13.88
Off-line EBT	\$2.91	\$3.67	\$1.43	\$4.88	\$4.48
Off-line EBT-coupon difference	-\$3.41	-\$2.31	-\$2.22	-\$8.80	-\$8.91
Number of stores (coupon & EBT)	67	20	16	20	11
Average store redemption ^c	\$31,791	\$61,066	\$38,974	\$10,359	\$7,086

Notes: ^a Average cost per store was derived by multiplying training time for trainers and trainees and wage for store, then averaging by store type.

^b Cost per \$1,000 of benefits (food stamp coupons in pre-implementation, total FSP in post-implementation training costs) redeemed represents a weighted average of individual store ratios of cost to \$1,000 of benefits redeemed at the store. Each store cost ratio is weighted by the store's redemption volume relative to total volume for other stores in the store type.

^c Training costs which are dependent on both EBT and coupon, were based on total FSP redemptions.

Source: Retailer pre-implementation and post-implementation Questions B1b-B1f: Staff members, wages and time required for food stamp training.

Methodology for Determining Reshelving Costs

Retailers were asked to estimate the amount of time required to reshelve items that food stamp recipients were unable to purchase due to insufficient coupons or insufficient electronic benefits. Estimates on the amount of time spent reshelving food stamp items were gathered for each type of employee involved in reshelving food items.

Reshelving costs were also standardized to represent cost per \$1,000 of each store's food stamp redemptions. Further, the average reshelving cost for each store type represents a weighted average where each store's reshelving cost is weighted by that store's redemption volume relative to the total volume for other stores in the store type.

Estimated Food Stamp Reshelving Costs

Exhibit 2-13 displays the details of our estimation of reshelving costs. In the pre-implementation, with the exception of other stores, supermarkets (which had the highest volume of food stamp redemptions) reported the lowest average reshelving costs per \$1,000 of benefits redeemed (\$3.70), and convenience stores reported the highest reshelving cost (\$8.35). Other stores reported an average reshelving cost of only \$1.01 per \$1,000 of benefits redeemed, due in large part to the fact that more than 90 percent of other stores report that they do not spend any time reshelving food stamp items, compared to five percent of supermarkets, 31 percent of grocery stores, and 32 percent of convenience stores. This difference derives from the specialized nature of other stores (typically bakeries, meat or fish markets, fruit and vegetable stands, or combination gasoline and food mart) and the comparatively small purchases recipients make there.

Exhibit 2-13

**RETAILER RESHELVING COSTS
(By Type of Store)**

	<u>All Stores</u>	<u>Super Markets</u>	<u>Grocery Stores</u>	<u>Convenience Stores</u>	<u>Other Stores</u>
Average reshelving time (hours per month)					
Coupon	15.71	38.64	12.31	3.56	1.06
Off-line EBT	13.97	36.92	9.38	1.49	1.64
Average wage (dollars per hour)					
Coupon	\$7.68	\$8.31	\$8.70	\$6.51	\$7.19
Off-line EBT	\$7.10	\$5.58	\$6.92	\$7.27	\$9.80
Number of retailers reporting Reshelving Costs					
Coupon	45	19	12	13	1
Off-line EBT	43	20	11	10	2
Average reshelving cost/store/month ^a					
Coupon	\$116.87	\$293.19	\$90.49	\$22.38	\$ 6.48
Off-line EBT	\$ 82.84	\$320.45	\$64.91	\$10.83	\$16.07
Average reshelving cost per \$1,000 benefits redeemed ^b					
Coupon	\$4.11	\$3.70	\$7.41	\$8.35	\$1.01
Off-line EBT	\$4.66	\$4.37	\$8.87	\$5.59	\$3.00
Off-line EBT-coupon difference ^b	\$0.55	\$0.67	\$1.46	-\$2.76	\$1.99
Number of Stores (coupon & EBT)	67	67	16	20	11
Average store redemption					
Coupon	\$28,644	\$79,318	\$13,025	\$2,681	\$6,436
Off-line EBT	\$25,094	\$73,320	\$7,321	\$1,938	\$5,361

Notes: ^a Average cost per store per month was derived by multiplying reshelving time and loaded wage rate for each store, then averaging by store type.

^b Cost per \$1,000 of benefits (food stamp coupons in pre-implementation, off-line EBT in post-implementation) redeemed represents a weighted average of individual store ratios of cost to \$1,000 of benefits redeemed at the store. Each store cost ratio is weighted by the store's redemption volume relative to total volume for other stores in the store type.

Source: Retailer pre-implementation Questions B9b-B9e and retailer post-implementation Questions B6b-B6e: Staff members, wages and time required to reshelve items because food stamp recipients had insufficient benefits to purchase.

Reshelving costs in the post-implementation wave were, in general, somewhat higher than in the pre-implementation wave, with average reshelving costs of \$4.11 in the pre-implementation and \$4.66 in the post-implementation wave. The distribution of reshelving costs was also different in the post-implementation wave, with grocery stores reporting the highest average reshelving cost per \$1,000 of benefits redeemed (\$8.87 grocery stores, \$4.37 supermarkets, \$5.59 convenience stores, \$3.00 other stores).

Other stores continued to have the lowest reported reshelving costs, although their post-implementation reshelving costs were substantially higher than in the pre-implementation (\$1.01 pre-implementation, \$3.00 post-implementation). More than 80 percent of the other store retailers again reported that they do not spend any time reshelving food stamp items, compared to zero percent of supermarkets, 31 percent of grocery stores and 50 percent of convenience stores. As in the pre-implementation, this difference accounts for the very low reshelving cost among other stores.

Exhibit 2-14 shows how reshelving costs in the off-line EBT demonstration compared to previous on-line demonstrations. Retailers in the off-line demonstration reported average reshelving costs per \$1,000 of benefits redeemed between the average values reported for the two state-initiated on-line demonstration locations (\$4.66 off-line vs. on-line: \$2.98 New Mexico, \$4.82 Ramsey County).

Exhibit 2-14

RETAILER RESHELVING COSTS
(Off-line vs. On-line System)

	<u>Off-line</u> <u>Montgomery County</u>	<u>On-line</u> <u>New Mexico</u>	<u>On-line</u> <u>Ramsey County</u>
Average resheling cost/store/month^a			
Coupon	\$116.87	\$5.27	\$4.57
EBT	\$82.84	\$51.13	\$22.25
Average resheling cost per \$1,000 benefits redeemed^b			
Coupon	\$4.11	\$0.67	\$1.72
EBT	\$4.66	\$2.98	\$4.82
EBT-coupon difference	\$0.55	\$2.31	\$3.10
Number of stores (coupon & EBT)	67	44	43
Average store redemption			
Coupon	\$28,644	\$16,329	\$2,706
EBT	\$25,094	\$34,498	\$5,619

Notes: ^a Average cost per store per month was derived by multiplying resheling time and loaded wage rate for each store, then averaging by store type.

^b Cost per \$1,000 of benefits (food stamp coupons in pre-implementation, off-line EBT in post-implementation) redeemed represents a weighted average of individual store ratios of cost to \$1,000 of benefits redeemed at the store. Each store cost ratio is weighted by the store's redemption volume relative to total volume for other stores in the store type.

Source: Retailer pre-implementation Questions 139b-139e and retailer post-implementation Questions 139b-139e; Staff members, wages and time required to reshelve items because food stamp recipients had insufficient benefits to purchase.

Float Costs

Float costs represent the cost (lost interest) to the retailer of accepting food stamp benefits as payment for food. The cost to the retailer begins at the time of the transaction, and continues until the credit for benefits redeemed is deposited and credited to the retailer's bank account. The off-line EBT system may decrease the average time from the purchase until the benefits are credited to the retailer's account. Under the coupon system, banks may require a minimum deposit amount or may require retailers to sort coupons by denomination and bundle them before depositing. Retailers with low food stamp redemptions may hold coupons for several days before they accumulate enough to deposit. Under EBT, all food stamp receipts are transmitted during settlement each day.

Methodology for Determining Float Costs

Float cost is estimated as the product of three variables: food stamp redemptions per month, days from purchase transaction to crediting the retailer account, and the interest rate. In the pre-implementation period, retailers were asked how often they deposited food stamp coupons and how many days it took their bank to make the funds available. In the post-implementation interview, we asked retailers to describe when food stamp transactions are credited and the incidence of delayed crediting. From those values we computed the average number of days from the purchase transaction to the crediting of the store's bank account. For consistency with on-line EBT evaluations, we used an interest rate of 4.84 percent, the rate used in evaluations of the Reading, New Mexico, and Ramsey County on-line systems.

Float costs per store per month were standardized to represent the cost per \$1,000 of each store's food stamp redemptions. Further, the average float cost for each store type represents a weighted average, where each store's float cost is weighted by that store's redemption volume relative to the total volume for other stores in the store type.

Estimated Float Costs

Exhibit 2-15 shows the float costs under coupon and off-line systems for all stores and stores by type. As expected, for all stores the average number of days from sale to crediting of the retailer 's account decreased from 2.01 under the coupon system to 1.37 under off-line EBT. Float costs were reduced under off-line EBT for all categories of stores except for other stores for which there was no difference. The differences compared to the coupon system ranged from \$0.00 to -\$0.12 per \$1,000 of food stamp redemptions. The weighted average float cost difference for all stores was -\$0.07.

The monetary value represented by food stamp benefits is always held by one of the parties in the redemption process. When retailer float is reduced under EBT, it is because the funds are debited more quickly from the FSP account with the U.S. Treasury. The float gained by retailers is lost by banks and/or the federal government.

Exhibit 2-15

FLOAT COSTS
(By Type of Store)

	<u>All Stores</u>	<u>Super Markets</u>	<u>Grocery Stores</u>	<u>Convenience Stores</u>	<u>Other Stores</u>
Average total days from sale to store credit					
Coupon	2.01	2.66	2.08	2.17	1.21
Off-line EBT	1.37	1.56	1.54	1.07	1.19
Average store cost cost/store/month					
Coupon	\$7.94	\$23.12	\$2.97	\$0.64	\$0.85
Off-line EBT	\$7.03	\$21.37	\$1.67	\$0.46	\$0.71
Average float cost per per \$1,000 of benefits redeemed*					
Coupon	\$0.22	\$0.29	\$0.23	\$0.24	\$0.13
Off-line EBT	\$0.15	\$0.17	\$0.17	\$0.12	\$0.13
EBT-coupon difference	-\$0.07	-\$0.12	-\$0.06	-\$0.12	\$0.00
Number of stores	67	20	16	20	11
Average store redemption					
Coupon	\$28,644	\$79,318	\$13,025	\$2,681	\$6,436
Off-line EBT	\$25,094	\$73,320	\$7,321	\$1,938	\$5,361

Note: * Costs per \$1,000 of benefits are calculated overall stores, including those with zero float.

Source: Retailer pre-implementation Questions B4: On average, how often do you deposit food stamp coupons? B4a. How many days does it take the bank to make the deposited funds available to you? Retailer post-implementation Question B7: On average, how many days does it take from the time you make an electronic food stamp sale to the time your bank makes the funds available to you?

Exhibit 2-16 compares float costs under off-line EBT to float costs reported for the on-line systems in New Mexico and Ramsey County. The average float saving of \$0.07 in the off-line system was similar to the \$0.04 float saving in New Mexico, but less than the \$0.36 saving reported for Ramsey County. The differences result primarily from variation in time from sale to store credit under the coupon systems in the three locations.

Exhibit 2-16

**FLOAT COSTS
(Off-line vs. On-line Systems)**

	<u>Off-line</u> Montgomery County	<u>On-line</u>	
		New Mexico	Ramsey County
Average total days from sale to store credit			
Coupon	2.01	3.9	5.0
EBT	1.37	2.4	1.4
Average store cost/store/month			
Coupon	\$7.94	\$2.13	\$1.33
EBT	\$7.03	\$3.93	\$0.89
Average float cost per \$1,000 of benefits redeemed*			
Coupon	\$0.22	\$0.26	\$0.54
EBT	\$0.15	\$0.22	\$0.18
EBT-coupon difference	-\$0.07	-\$0.04	-\$0.36
Number of stores	67	44	43
Average store redemption			
Coupon	\$28,644	\$16,329	\$2,706
EBT	\$25,094	\$34,498	\$5,619

Note: * Costs per \$1,000 of benefits are calculated over all stores, including those with zero float.

Source: Retailer pre-implementation Questions B4: On average, how often do you deposit food stamp coupons? B4a. How many days does it take the bank to make the deposited funds available to you? Retailer post-implementation Question B7: On average, how many days does it take from the time you make an electronic food stamp sale to the time your bank makes the funds available to you?

Accounting Error Losses

Accounting error costs may be incurred as a result of mistakes in counting and aggregating food stamp coupons or EBT settlement data. Errors result from discrepancies between the amount reported and the amount tallied. Dollar loss may also result from funds floating during the time needed for error reconciliation and from losses that are never reconciled.

Food Stamp Coupon Accounting Activities

In the coupon system, accounting error losses occur if there is a discrepancy between the amount of coupons the retailer has counted and sent to the bank for deposit, and the amount the bank has credited to the retailer's account.

Off-line EBT Accounting Activities

Under the off-line EBT system, accounting error losses may occur if the food stamp recipient removes his or her PayEase card before the transaction has been completed, or if the electronic transmission of transaction data to the EBT host is interrupted. It is the responsibility of the retailer to reconcile any discrepancies between the food stamp redemption and the amount printed on the retailer's settlement receipt. The EBT processor has incorporated software in its system to help retailers identify daily settlements where communication errors may have occurred.

Methodology for Determining Accounting Error Losses

Retailers were asked to report the amount of money in food stamp coupon or EBT sales that they had lost *permanently* because of accounting errors.

Accounting error losses were standardized to represent the cost per \$1,000 of each store's food stamp redemptions. Further, the average accounting error loss for each store type represents a weighted average, where each store's accounting error loss is weighted by that store's redemption volume relative to the total volume for other stores in the store type.

Estimated Accounting Error Losses

Nearly one out of five stores reported that they had experienced a permanent loss of funds due to an error in counting or depositing food stamps coupons or the crediting of their account (10 percent pre-implementation, 19 percent post-implementation). Of those stores that reported experiencing a permanent loss during the pre-implementation interviews, 70 percent were supermarkets. Supermarkets also reported a much higher average value for the losses they experienced -- \$417.50 compared to an average loss of \$50.50 for grocery stores and \$5.00 for convenience stores. No other stores reported a permanent accounting error loss during the pre-implementation interviews. See Exhibit 2-17.

In the post-implementation wave, more stores experienced permanent losses due to accounting errors, and the losses were spread more evenly across the four store types: 38 percent of the stores reporting a permanent loss were supermarkets, 23 percent were grocery stores, 15 percent were convenience stores, and 23 percent were other stores. The average amount of the loss reported by the retailers was less in the post-implementation wave (\$306.14 pre-implementation, \$76.74 post-implementation), but because there were more stores reporting losses, the overall total amount of the loss was greater than in the pre-implementation. Other stores, which had not experienced any permanent accounting error losses in the pre-implementation, reported the highest average loss in the post-implementation wave (\$156.50). Standardized losses per \$1,000 of food stamp benefits redeemed increased over all stores from \$0.23 under coupons to \$0.41 under off-line EBT.

Exhibit 2-17

**RETAILER ACCOUNTING ERROR LOSSES
COUPON AND OFF-LINE EBT SYSTEMS
(By Type of Store)**

	<u>All Stores</u>	<u>Super Markets</u>	<u>Grocery Stores</u>	<u>Convenience Stores</u>	<u>Other Stores</u>
Number of stores reporting non-zero losses					
Coupon	7	5	1	1	0
Off-line EBT	13	5	3	2	3
Average value of permanent losses for stores with non-zero losses in last 6 months					
Coupon	\$306.14	\$417.50	\$50.50	\$5.00	\$0.00
Off-line EBT	\$ 76.74	\$112.50	\$63.75	\$7.50	\$156.50
Cost/\$1,000 of benefits redeemed ^a					
Coupon	\$0.23	\$0.60	\$0.20	\$0.01	\$0.00
Off-line EBT	\$0.41	\$0.29	\$2.03	\$0.11	\$0.43
Off-line EBT-coupon difference	\$0.18	-\$0.42	\$1.71	\$0.08	\$0.25

Number of stores (coupon & EBT)	67	20	16	20	11
Average food stamp redemptions					
Coupon	\$28,644	\$79,318	\$13,025	\$2,681	\$6,436
Off-line EBT	\$25,094	\$73,320	\$ 7,321	\$1,938	\$5,361

Note: * Costs per \$1,000 of benefits are calculated over all stores, including those with zero losses.

Source: Retailer pre-implementation Question B10: Has the store ever lost money permanently in food stamp coupon sales because of errors made in counting, depositing or crediting your account? B10a. The last time this happened, how much did you lose? Retailer post-implementation Question B8: Has the store ever lost money, permanently in electronic food stamp sales because the sale was recorded wrong or the wrong amount was deposited? B8a: The last time this happened, how much did you lose?

Exhibit 2-18 compares accounting error losses under off-line EBT to those experienced by retailers in the on-line demonstrations in New Mexico and Ramsey County. Stores that experienced accounting errors lost more on average in the off-line EBT demonstration than in either of the on-line EBT demonstrations. However, when comparing losses per \$1,000 of

benefits redeemed, the off-line system increased losses by \$0.18 under EBT, while the on-line systems increased accounting error losses by \$0.37 and \$1.29 in New Mexico and Ramsey County.

Exhibit 2-18

**RETAILER ACCOUNTING ERROR LOSSES
COUPON AND EBT SYSTEMS
(Off-line vs. On-line Systems)**

	<u>Off-line</u> <u>Montgomery County</u>	<u>On-line</u>	
		<u>New Mexico</u>	<u>Ramsey County</u>
Number of stores reporting non-zero losses			
Coupon	7	3	1
EBT	13	14	10
Average value of permanent losses for stores with non-zero losses in last 6 months			
Coupon	\$306.14	\$ 2.00	\$ 9.17
EBT	\$ 95.25	\$27.78	\$33.29
Cost/\$1,000 of benefits redeemed*			
Coupon	\$0.23	\$0.03	\$0.09
EBT	\$0.41	\$0.40	\$1.38
EBT-coupon difference	\$0.18	\$0.37	\$1.29
Number of stores (coupon & EBT)	67	44	43
Average food stamp redemptions			
Coupon	\$28,644	\$16,329	\$2,706
EBT	\$25,094	\$34,498	\$5,619
Notes: * Costs per \$1,000 of benefits are calculated over all stores, including those with zero losses.			
Source: Retailer pre-implementation Question B10: Has the store ever lost money <u>permanently</u> in food stamp coupon sales because of errors made in counting, depositing or crediting your account? B10a: The last time this happened, how much did you lose? Retailer post-implementation Question B8: Has the store ever lost money <u>permanently</u> in <u>electronic</u> food stamp sales because the sale was recorded wrong or the wrong amount was deposited? B8a: The last time this happened, how much did you lose?			

Space Costs

The arrangement of merchandise and equipment in the checkout area is very important to the retailer in establishing a relationship with the customer and in driving business. Items displayed in the checkout area are high volume products, and the sale of these items is important to the profitability of the retailer in this competitive market. EBT uses a portion of this space for the equipment needed to run the system. Therefore the value to the retailer of this space must be included in the evaluation of the EBT costs. In contrast, coupons, although they occupy space in the cash drawer, do not take up space that has alternative value to the retailers.

Food Stamp Coupon Activities

In the coupon system, space costs are so minimal as to be considered non-existent. The only space required by the coupon system is room in the cash drawer for holding the coupons during each cashier's shift. Because this is not generally revenue generating space, space costs for the pre-implementation were given a cost of zero.

Off-line EBT Activities

In the off-line EBT system, the EBT equipment occupies valuable front-end space, displacing merchandise or advertising that the retailer might otherwise display in that area. Therefore, space costs result from the lost revenue that retailers may experience when they replace a candy or cigarette display with EBT equipment. In practice, many stores place the off-line EBT equipment behind the counter, under or over other equipment, or on stands built to hold it. In those cases, the equipment does not displace other valuable uses of the space.

Methodology for Determining Space Costs

Retailers were asked to report the amount of space taken up by the EBT equipment, and to describe the other uses for that space were it not for the presence of the EBT equipment. EBT equipment space costs are estimated to be the product of the amount of space occupied by the

EBT equipment which had an alternative use (as reported by the retailer), and the unit cost of the space, as reported by the retailers.

We considered the possibility of basing estimates of space value on the value assigned to the occupied space by a retail association or a commercial realtor in the area, but were unable to obtain an estimate from these sources for the unit cost of space for the different store categories in the Dayton area. Further, we were concerned that different parts of the store have different value to the retailer, and assigning a value that is essentially the rental value of a foot of retail space does not adequately reflect the value of the EBT equipment space to the retailer. Therefore, we calculated the EBT equipment space cost based on the retailer's reported perceptions of the value of that space.

Estimated Space Costs

Exhibit 2-19 displays the computed space costs for EBT equipment. On average, the space occupied by EBT equipment across all stores contributed \$0.56 per \$1,000 of benefits redeemed to the cost of retailer operations. However, the estimated space costs differed greatly by store type, ranging from \$0.30 in supermarkets to \$4.89 in other stores. This includes the total reported EBT space values for all retailers including those who reported an alternative use for the space and those who reported that the space had a value of zero. One-third of the retailers reported that the EBT space had zero value, and an additional 13 percent had no alternative use for the EBT equipment space. If we exclude from the calculation stores that reported zero value or no alternative use for the space, the average cost per \$1,000 of benefits redeemed is \$1.13 for all stores, \$0.39 for supermarkets, \$2.48 for grocery stores, \$11.54 for convenience stores, and \$9.99 for other stores.

EBT equipment space costs for the on-line EBT demonstrations were calculated using a space cost value obtained from commercial realtors rather than retailer perceptions, so direct comparisons will show some inherent differences. However, an examination of EBT equipment space costs for the two systems (looking only at that space which had an alternative use) shows the costs for the off-line system (\$0.56 per \$1,000 of redemptions) lower than the costs reported

in Ramsey County (\$2.08 per \$1,000 of redemptions) and slightly greater than those reported in New Mexico (\$0.37 per \$1,000 of redemptions).

Exhibit 2-19

RETAILER EBT EQUIPMENT SPACE COSTS

	<u>All Stores</u>	<u>Super Markets</u>	<u>Grocery Stores</u>	<u>Convenience Stores</u>	<u>Other Stores</u>
Average cost per square foot (\$ per month)	\$13.36	\$13.25	\$14.81	\$12.30	\$13.36
Average EBT space (square feet per store)	4.99	10.45	2.88	2.45	2.73
Average store cost/month ^a (\$ per month)	\$59.43	\$118.75	\$36.94	\$32.85	\$32.64
Cost/\$1,000 of benefits redeemed ^b	\$0.56	\$0.30	\$0.44	\$4.03	\$4.89
Number of stores (coupon & EBT)	67	20	16	20	11
Average store EBT redemptions	\$25,094	\$73,320	\$7,321	\$1,938	\$5,361

Notes: ^a Represents all reported space values, including zero. If zero values are excluded, the average cost/store/month is \$89.22 for all stores, \$169.64 supermarkets, \$65.67 grocery stores, \$43.80 convenience stores and \$59.83 other stores.

^b Represents all reported space costs, including zero. If zero values are excluded, the average cost/\$1,000 benefits redeemed is \$1.13 for all stores, \$0.39 supermarkets, \$2.48 grocery stores, \$11.54 convenience stores and \$9.99 other stores.

Source: Retailer post-implementation Question B9: Approximately how many square feet of space in this store are taken up by PayEase equipment? B9a: What would this space be used for if the PayEase equipment were not there? B9b: What is the value of this space per square foot per month?

Total Costs

The overall participation costs for retailers decreased under the off-line EBT system in comparison to the paper coupon based system. This decrease in costs held true for all four retailer categories. See Exhibit 2-20.

Exhibit 2-20

**SUMMARY OF RETAILER PARTICIPATION COSTS
PER \$1,000 OF BENEFITS REDEEMED
(By Type of Store)**

	<u>All Stores</u>	<u>Super Markets</u>	<u>Grocery Stores</u>	<u>Convenience Stores</u>	<u>Other Stores</u>
Checkout productivity					
Coupon	\$0.80	\$1.14	\$1.05	\$0.33	-- ^a
Off-line EBT	\$2.01	\$1.18	\$4.03	\$9.05	N/A ^a
Handling/reconciliation^b					
Coupon	\$12.93	\$9.83	\$23.18	\$50.60	\$25.49
Off-line EBT	\$ 4.46	\$3.75	\$ 5.58	\$20.87	\$ 9.07
Ongoing training					
Coupon	\$6.32	\$5.98	\$3.65	\$13.68	\$13.88
Off-line EBT ^c	\$2.91	\$3.67	\$1.43	\$ 4.88	\$ 4.48
Reshelving					
Coupon	\$4.11	\$3.70	\$7.41	\$8.35	\$1.01
Off-line EBT	\$4.66	\$4.37	\$8.87	\$5.59	\$3.00
Float					
Coupon	\$0.34	\$0.35	\$0.28	\$0.29	\$0.16
Off-line EBT	\$0.20	\$0.21	\$0.20	\$0.14	\$0.16
Accounting error					
Coupon	\$0.23	\$0.60	\$0.20	\$0.01	\$0.00
Off-line EBT	\$0.41	\$0.29	\$2.03	\$0.11	\$0.43
Space					
Coupon	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Off-line EBT	\$0.56	\$0.30	\$0.44	\$4.03	\$4.89
Total participation cost					
Coupon	\$24.73	\$21.60	\$35.77	\$73.26	\$40.54
Off-line EBT	\$15.21	\$13.77	\$22.58	\$44.67	\$22.03

Notes: ^a Checkout observations were not conducted in other stores.

^b Anomalous pre-implementation handling data which could not be resolved were removed from the pre-implementation coupon analysis.

^c Based on total Food Stamp Program redemptions investigated.

The reduction in time required for handling and reconciliation represented the biggest savings area of off-line EBT over the paper coupon system. All store types reported a savings in this area. Convenience stores experienced the biggest savings, reporting a handling/reconciliation cost savings of \$29.73 per \$1,000 of benefits redeemed. Supermarkets, which had the lowest estimated coupon handling cost, experienced the smallest savings of any store type, \$6.08 per \$1,000 of benefits redeemed.

Retailers reported minor savings in float costs (the costs of foregone interest on food stamp deposits). The average cost savings was \$0.14 per \$1,000 of benefits redeemed, and derived almost entirely from the reduction of the time between the food stamp purchase and the time the funds are credited at the retailer's bank. The daily settlement of food stamp transactions in the off-line EBT system minimizes that source of float time and cost.

The cost to the retailer of food stamp training activities also decreased on average by \$3.41, but the impact differed substantially by store type. The training costs in other stores decreased by \$9.40 per \$1,000 of benefits redeemed. Convenience stores reported a savings of \$8.80 per \$1,000 of benefits redeemed, while grocery stores reported a savings of \$2.22 per \$1,000 of benefits redeemed. Supermarkets saved \$2.31 per \$1,000 redeemed.

Retailers reported an increase in costs associated with reshelfing items that food stamp recipients could not purchase due to insufficient benefits, ineligibility of item, or some other reason. Supermarkets, grocery stores and other stores reported an increase in reshelfing costs (\$0.67 supermarkets, \$1.46 grocery stores, \$1.99 other stores). Convenience stores reported a decrease in reshelfing costs under the off-line EBT system.

Accounting error costs increased slightly under the off-line EBT system for most retailers. This overall increase in perceived errors could be due to difficulties experienced by retailers in the initial stages of implementation. Grocery stores, convenience stores, and other stores reported an increase in accounting error costs under the new system. The increase in costs ranged from a high of \$1.83 in grocery stores to an increase of only \$0.10 in convenience stores. Supermarkets experienced a small decrease in accounting error costs (-\$0.31).

Exhibit 2-21 summarizes the cost components and total participation costs for the off-line system and the on-line systems in New Mexico and Ramsey County. The off-line system saved retailers \$9.52 per \$1,000 of benefits redeemed compared to \$3.98 in New Mexico and \$9.09 in Ramsey County.

Exhibit 2-21

**SUMMARY OF RETAILER PARTICIPATION COSTS
PER \$1,000 OF BENEFITS REDEEMED**
(Off-line vs On-line Systems)

	<u>Off-line</u> <u>Montgomery County</u>	<u>On-line</u> <u>New Mexico</u>	<u>On-line</u> <u>Ramsey County</u>
Check-out productivity			
Coupon	\$0.80	\$0.05	\$1.09
EBT	\$2.01	\$1.87	\$3.01
Handling/reconciliation*			
Coupon	\$12.93	\$15.80	\$37.74
EBT	\$4.46	\$6.14	\$20.08
Ongoing training			
Coupon	\$6.32	\$1.02	\$4.87
EBT	\$2.91	\$1.87	\$5.41
Reshelving			
Coupon	\$4.11	\$0.67	\$1.72
EBT	\$4.66	\$2.98	\$4.82
Float			
Coupon	\$0.34	\$0.26	\$0.54
EBT	\$0.20	\$0.22	\$0.18
Accounting error			
Coupon	\$0.23	\$0.03	\$0.09
EBT	\$0.41	\$0.40	\$1.38
Space			
Coupon	\$0.00	\$0.00	\$0.00
EBT	\$0.56	\$0.37	\$2.08
 Total participation cost			
Coupon	\$24.73	\$17.83	\$46.05
EBT	\$15.21	\$13.85	\$36.96

Notes: * Anomalous pre-implementation handling data which could not be resolved were removed from the off-line pre-implementation coupon analysis.

Sources: Pre-implementation and post-implementation observation and retailer interview data.

Chapter 3

IMPACT OF THE OFF-LINE EBT SYSTEM ON FOOD STAMP RECIPIENTS

In the off-line EBT demonstration, known in Ohio as PayEase, recipients access food stamp benefits through the use of a smart card. The card contains a microprocessor chip and memory into which each month's benefit allotment is loaded the first time the card is presented at a store terminal following benefit issuance. Recipients receive their cards and are trained in using them during special training sessions at the county welfare office. To purchase groceries with the PayEase card, recipients insert their cards in a special terminal at the check-out counter, enter their personal identification number (PIN), and authorize the deduction of the purchase amount. Purchases are debited against the balance of benefits on the card, and the value of the purchase is subsequently credited to the retailer's bank account. Lost, stolen and damaged PayEase cards are replaced at no cost to recipients. The unspent balance of benefits on lost, stolen, or damaged cards is restored when the cards are replaced. Recipients keep track of balances on their cards through retention of printed receipts showing the balance, through balance inquiries at special terminals in stores, or through calling a PayEase customer service number.

Under the coupon issuance system that preceded EBT in Montgomery County, recipients appeared in person each month at an issuance center to sign an authorization document and receive their coupon allotments. Coupons were tendered to grocers in payment for eligible food items. Recipients received change in one-dollar food stamp coupons and in cash for amounts less than one dollar. If recipients lost their coupons or had them stolen, they could not get replacements. Damaged coupons that were unusable could be replaced.

In evaluating the impacts of the off-line EBT system, it was important to identify and measure the ways in which the EBT system and the coupon system it replaced affected recipients. The evaluation sought to assess how the off-line EBT system affects the timeliness and accuracy of benefit issuance, the levels of recipient service, and the ability of recipients to use their benefits at retailers. It also sought to measure recipients' costs of participation in terms of both time and money, as well as their perceptions about the safety and accessibility of their benefits and the integrity of the program.

INTRODUCTION

This chapter presents the evaluation of impacts of the off-line EBT system on recipients. Throughout the chapter, measured outcomes under the off-line EBT demonstration are compared to three relevant alternatives: the coupon system operating in Montgomery County before conversion to EBT, the coupon system operating in Franklin County which served as a control site, and the on-line EBT systems operating in New Mexico and Ramsey County, Minnesota.¹ The primary data used in these analyses came from telephone and in-person interviews with representative samples of recipients in Montgomery and Franklin counties.

The first section of this chapter presents the design of the recipient impact evaluation including the research design, research questions, samples, and data collection methods. The next section addresses the costs recipients incur to participate in the FSP under the paper coupon issuance system and under off-line EBT. Costs considered include direct out-of-pocket costs, costs of recipients' time to obtain benefits and deal with problems, and opportunity costs related to delayed or missing benefits. Next, the chapter presents analyses of the problems encountered by recipients in obtaining benefits under the two issuance systems to assess the timeliness and accuracy of the benefit delivery systems. Additional sections discuss recipient perceptions of security, fraud and benefit diversion under the issuance systems; how recipients are treated by store employees when they purchase groceries using food stamp coupons or EBT benefits; recipients' preferences for coupons or EBT and the reasons they mentioned; and impacts of EBT on recipient shopping patterns. The final section presents time series data to assess whether EBT caused changes in FSP participation rates.

DESIGN OF THE RECIPIENT IMPACT EVALUATION

Measures of impacts of EBT on recipients were based on interviews with two cross-sectional samples of food stamp recipients in the Montgomery County demonstration area. The primary objective of the recipient interviews was to evaluate the costs of participation and the

¹ Comparisons to on-line EBT systems are based on data reported in John A. Kirlin, et al., The Impacts of the State-Initiated EBT Demonstration on the Food Stamp Program, Cambridge, Massachusetts: Abt Associates Inc., June, 1993.

perceptions of service when benefits are issued under off-line EBT as compared to the coupon issuance system. A pre/post research design allowed assessment of changes in the Montgomery County demonstration area from a pre-implementation period under coupon issuance to a post-implementation period, when EBT had achieved stable operation. The analyses presented in this chapter examine differences from pre- to post-implementation in the EBT demonstration area and compare the magnitude of the changes to pre- and post-implementation changes in the comparison area.

Samples of recipients in Franklin County, Ohio were surveyed as a comparison group during the same two periods as the demonstration area interviews. The use of a comparison site in this quasi-experimental evaluation provides a reference against which to assess the likelihood that any observed changes in Montgomery County could be attributed to the new EBT system. Franklin County was selected as the comparison site after detailed analysis of demographics, administrative systems for food stamp case management and issuance, local economies, and geographic considerations. While Franklin County was not identical to Montgomery County, it was similar enough that trends and events in Ohio that affected food stamp recipients should have been apparent in both sites in about the same degree. Appendix D describes in detail the process by which the comparison site was selected.

One possible dissimilarity between the demonstration and comparison sites needs to be noted. Ohio implemented an enhanced automated eligibility system known as CRIS-E. Conversion to CRIS-E required all existing cases to be recertified, after which new benefit determinations were made. That process had been completed in Franklin County, and recipients had received multiple issuances under CRIS-E at the time of pre-implementation data collection. In contrast, Montgomery County was beginning conversion to CRIS-E in the months before the demonstration began, and had completed conversion in the demonstration zip codes just before off-line EBT was implemented. The change to CRIS-E in the period immediately before pre-implementation data collection in Montgomery County may have increased the apparent costs to recipients of participation under coupon issuance.

Research Questions

The evaluation examined several elements of cost that recipients might incur in obtaining and using their food stamp benefits:

- Costs of obtaining benefits from the county welfare department and issuance agents (direct out-of-pocket expenses and time);
- Cost of dealing with problems (direct out-of-pocket expenses and time); and
- Opportunity costs of lost, stolen, damaged and delayed benefits.

In addition to assessing costs, other objectives of the recipient survey were to:

- Identify problems encountered in receiving and using the benefits;
- Obtain perceptions regarding security, fraud, and unintended use of FSP benefits, under both coupon and EBT;
- Measure opinions of treatment of FSP recipients by store employees;
- Assess recipients' preferences for receiving benefits electronically as opposed to food stamp coupons and the reasons they state;
- Examine changes in shopping patterns related to the change from coupon to EBT issuance; and
- Assess the impact of the change from coupons to EBT on recipient participation in the FSP.

Samples

The evaluation samples included a pre-implementation (baseline) sample of 810 recipients and a post-implementation sample of 814 recipients in Montgomery County. The Franklin County comparison site samples included a pre-implementation sample of 876 and a follow-up sample of 788 food stamp recipients. These were fresh, cross-sectional samples. The Montgomery County samples were randomly selected from the six demonstration zip codes in both waves, and the Franklin County sample was selected from three comparison zip codes in both waves. Both samples were stratified by household composition -- whether or not dependent

children were part of the recipient's household -- a variable that was related to costs of program participation in previous evaluations.

Beyond the explicit stratification on children in the household, other variables hypothesized to be related to impact on recipients were used for implicit stratification. Examples include households receiving other forms of public assistance and the presence of elderly residents in households. The procedure was to sort the sampling frame on the basis of these variables within the explicit strata that were formed, and then use a systematic selection with a random start for drawing the sample of households from each explicit stratum. This implicit stratification assured that the sample distribution on those variables approximated very closely the distribution in the population of recipients. The effects of stratification are to reduce within-stratum variance and, hence, improve the precision of estimates and the power of comparisons.

Data Collection Procedures

Recipient interviews were conducted by telephone with approximately 60 percent of the sampled recipients. Recipients in the samples who could not be reached by phone were interviewed in person in their homes. The baseline interviews were conducted during the period November, 1991 through January, 1992. Follow-up interviews were conducted between November, 1992 and January, 1993. Survey completion rates were 74.5 percent in Montgomery County and 62.6 percent in Franklin County. Cooperation rates among households that could be contacted were 97 percent in Montgomery County and 96 percent in Franklin County. Complete sample disposition tables appear in Appendix E along with detailed tables of demographic characteristics of respondents.

SUMMARY OF RECIPIENT COSTS TO PARTICIPATE

Recipients incur costs to participate in the FSP, and those costs reduce the effective value of the benefits received. An important objective of the evaluation is to assess the cost of participation under off-line EBT compared to the paper coupon system of issuance that preceded it, and to the on-line EBT systems evaluated elsewhere. If the EBT system reduces costs to recipients, the effectiveness of the program is enhanced. Out-of-pocket costs for the two systems

principally include expenses for travel to food stamp offices for receiving benefits, resolving problems, and replacing lost or stolen benefits. Recipients with young children may also incur child care expenses when they travel to the food stamp offices.

The time spent on food stamp business is time away from other activities, and the loss of that time is a cost to recipients. For example, those who are employed may have to take time off from work and may lose wages. Others give up time that would have been spent in household management, family care or leisure.

Another major component of participation cost is opportunity cost resulting from the loss or theft of benefits or from delays in receiving benefits. An effective issuance system will deliver the right benefits on time and reduce vulnerability to loss and theft of benefits.

Methodology for Estimating Costs

The methods for computing the costs of participation are described below:

- **Direct Costs of Obtaining Benefits.** These include, where applicable, mileage to and from the issuance center at the federal reimbursement rate of \$0.25 per mile, money spent for parking, tolls, bus, taxi, and costs for child care.
- **Time Spent Obtaining Benefits.** This includes time spent at the issuance center, as well as traveling to and from the center. Recipient time was valued at the minimum wage of \$4.25 per hour. Other values considered were actual wages lost and average hourly wage of food stamp recipients. However, data were not available in specific enough detail to allow the use of actual wages lost. The minimum wage is used to provide an objective comparison of costs of participation under the two systems.
- **Direct Costs of Dealing with Problems.** Again, these include, where applicable, mileage to and from the food stamp office at \$0.25 per mile, money spent for parking, tolls, bus, taxi, and costs for child care.

- **Time Spent Dealing with Problems.** This includes time spent talking on the telephone with the food stamp office, time spent at the food stamp office and time spent traveling to and from the food stamp office to deal with problems.
- **Opportunity Costs.** Opportunity costs are incurred when coupons/cards are delayed, damaged, lost, or stolen. The opportunity costs for delayed or damaged coupons were calculated as the dollar amount of benefits involved times the prevailing unsecured consumer loan interest rate (18 percent) during the duration for which the benefits were not available. That rate reflects the cost of money recipients would pay if they borrowed money to replace the delayed benefits. For delayed/damaged benefits that were not replaced, and for lost and stolen *coupon* benefits, the opportunity costs were calculated as the entire value of the benefits involved. Under paper coupon issuance, no lost or stolen coupons were replaced. In contrast, under the EBT system lost or stolen benefits that had not been spent could be replaced. Therefore, in instances where the recipient had their lost or stolen electronic benefits replaced, only the time costs of the dollar value of delayed benefits were included. All opportunity costs were adjusted to reflect the frequency of occurrence of the problem during the six-month period.

Participation costs were calculated only for respondents with complete cost information. Because the percentage of respondents with incomplete information was so small (ranging from 2 percent post-implementation Montgomery County, to 0 percent pre-implementation Franklin County), it was decided to conduct cost analyses only on complete cases, therefore retaining the integrity of the data set.

Cost of Participation

Total costs and major components of cost per month of program participation are displayed in Exhibit 3-1. Subsequent tables display the details of how each component was calculated. For recipients in Montgomery County, the average total cost per month was \$2.52 under EBT compared to \$13.39 under coupon issuance. Participation costs decreased from baseline to follow-up in Franklin County as well, although the size of the decrease was much

smaller in the comparison site: a decline of \$10.87 in the Montgomery County demonstration area versus a decline of \$1.46 in the comparison site. If the apparent savings due to EBT are reduced by the amount of the cost reduction in Franklin County, the resulting savings to Montgomery County recipients is \$9.41 per month.

Exhibit 3-1 shows for comparison the costs per month of program participation in the on-line EBT demonstrations in New Mexico and Ramsey County. In both of those demonstrations, the baseline cost of participation under coupon issuance was substantially lower than in Montgomery or Franklin counties, presumably because most recipients there received mail issuance and were not required to travel to issuance centers to obtain their benefits. In both on-line demonstrations participation costs fell significantly after EBT was implemented.

Total participation costs represent the sum of recipients' direct cost of obtaining food stamp benefits (including dealing with problems), the time required to obtain benefits and resolve problems, and opportunity costs related to lost, stolen, or delayed benefits. Costs under off-line EBT were lower than under the coupon issuance system in each of these three components.

An analysis of variance was conducted on total costs and time costs of participation. The interaction of WAVE * COUNTY was statistically significant ($p < .0001$) for both variables. These data are consistent with the conclusion that EBT lowered costs of participation to recipients. The analysis also tested whether having young children in the household affected the savings recipients experienced under EBT. The categorical variable CHILDREN did not interact significantly with WAVE or COUNTY. This indicates that the lower costs experienced by recipients under off-line EBT did not differ between households with children and those with no children. Because of that finding, the two strata were combined for presentation in this chapter. The details of the analysis of variance are presented in Appendix F.

Exhibit 3-1

**MONTHLY RECIPIENT COSTS OF
OBTAINING FOOD STAMP BENEFITS**

SUMMARY OF COSTS

<u>Costs Per Month of Program Participation</u>	<u>Montgomery County</u>	<u>Franklin County</u>	<u>New Mexico</u>	<u>Ramsey County</u>
Baseline (coupon)				
Direct cost	\$1.97	\$1.79	\$0.33	\$0.11
Time cost	5.99	3.87	0.22	0.30
Opportunity cost	5.43	3.61	2.48	2.83
Total cost	13.39	9.27	3.03	3.24
(BASE)	(809)	(876)	(85)	(87)
Follow-up (EBT, except Franklin)				
Direct cost	0.43	1.27	0.31	0.65
Time cost	0.73	3.41	0.78	0.91
Opportunity cost	1.36	3.13	0.35	0.39
Total cost	\$2.52	\$7.81	\$1.44	\$1.95
(BASE)	(796)	(784)	(73)	(71)

Analysis of variance on TOTAL COST showed that the WAVE * COUNTY interaction was statistically significant ($p < .0001$) for the comparison between baseline and follow-up across the Montgomery County test site and Franklin County control site.

Source: Montgomery and Franklin Counties: baseline and follow-up recipient interviews. New Mexico and Ramsey County: Kirlin, John A. et al., *The Impacts of State-Initiated EBT Demonstrations on the Food Stamp Program*. Abt Associates, June 1993.

BASE = Number of recipient respondents who answered the question.

COMPONENTS OF RECIPIENT COSTS

Direct Costs

Exhibits 3-2 and 3-3 show the direct costs of participation in the baseline and follow-up periods. Direct costs were lower under EBT because the expenses associated with traveling to an issuance center were eliminated. In Montgomery and Franklin counties, the baseline coupon issuance system required recipients to appear monthly in person at an issuance center equipped with an on-line, over-the-counter issuance terminal to sign an authorization document and obtain their coupon allotment. Under EBT, the benefit allotment is downloaded to the PayEase card the first time the card is presented at a designated store terminal on or after the issuance date each month. Recipients get their benefits as they shop and do not have to make a special trip to get their benefits. The savings in transportation costs associated with obtaining benefits are meaningful. Costs to recipients under other coupon issuance systems may be lower or higher than those measured in this evaluation.

Under EBT, recipients experienced the direct costs associated with training. They were called in to the welfare office to receive training, select personal identification number (PINs), have their pictures taken, and designate three stores at which they could have their monthly allotments downloaded to the card. They generally had to return to the office to pick up their cards and have them activated. Unlike the monthly trips to issuance centers under coupon issuance, recipients incurred these training costs one time only.

Under EBT, there was no decrease in the direct costs of dealing with issuance problems. Problems of delayed issuance and issuance of incorrect allotments required recipients to contact the county welfare office by telephone or in person. It is notable that costs of dealing with issuance problems were substantially greater in Montgomery County than in Franklin County in both waves of the survey. The CRIS-E system had been implemented fully in Franklin County prior to the baseline wave and was operating in a stable mode. In contrast, Montgomery County was converting cases to CRIS-E in the demonstration area at the time of the baseline, and many recipients had received only two issuances under the new system when they were interviewed. Since conversion of cases to CRIS-E required recertification and new benefit determinations, it

was not unusual for allotments to change as a result of the conversion process. Recipients' reactions to receiving unfamiliar amounts could have been the reason for the higher cost in Montgomery County of dealing with problems in the baseline (Montgomery \$0.24 vs. Franklin \$0.10). Additionally, problems with the EBT system in the initial month or two caused some delayed issuances and some cases of over- or under-issuance. Although such problems became less common after the first two months, respondents recalled those problems when asked about them in the follow-up interviews.

Exhibit 3-2

**MONTHLY RECIPIENT COSTS OF
OBTAINING FOOD STAMP BENEFITS**

BASELINE DIRECT COSTS

	<u>Montgomery County</u>	<u>Franklin County</u>
Direct costs of obtaining benefits		
Childcare	\$0.04	\$0.07
Travel	1.69	1.62
Direct costs of dealing with problems		
Childcare	0.03	0.01
Travel	0.21	0.09
Direct costs of EBT training		
Childcare	N/A	N/A
Travel	N/A	N/A
Total direct costs of program participation: baseline	\$1.97	\$1.79

Source: Baseline recipient interviews.

N/A = Not Applicable

Exhibit 3-3

**MONTHLY RECIPIENT COSTS OF
OBTAINING FOOD STAMP BENEFITS**

FOLLOW-UP DIRECT COSTS

	<u>Montgomery County</u>	<u>Franklin County</u>
Direct costs of obtaining benefits		
Childcare	N/A	\$0.03
Travel	N/A	1.15
Direct costs of dealing with problems		
Childcare	\$0.05	0.02
Travel	0.20	0.07
Direct costs of EBT training		
Childcare	0.03	N/A
Travel	0.15	N/A
Total direct costs of program participation: follow-up	\$0.43	\$1.27

Note: * Cost associated with obtaining benefits was not applicable to Montgomery County as benefits were down-loaded to the recipient's card during the course of an ordinary shopping trip.

Source: Follow-up recipient interviews.

N/A = Not Applicable

Time Costs

The change in issuance systems may affect the amount of time recipients must devote to participating in the program. The evaluation addressed the following research questions: How does the demonstration affect the amount of time spent by recipients to secure benefits and resolve issuance related problems? What is the value of the time spent in terms of opportunity

cost, foregone wages, or loss of leisure? It was anticipated that recipients would spend less time and money to receive benefits under the demonstration than under the coupon issuance system. Most recipients under the coupon system must travel to an issuance agent location to receive their coupons. That monthly trip, and the problems and costs associated with it, should be unnecessary under the EBT system. Under the EBT system, the only trips required were to the local food stamp office for certification and for training, and then any subsequent trips for problem resolution (such as replacing lost or stolen cards, replacing damaged cards, or resolving issuance disputes).

Exhibits 3-4 and 3-5 display the hours recipients spent obtaining benefits and dealing with problems in the baseline and follow-up periods. In Montgomery County, recipients spent nearly one and one-fourth hours (75 minutes) per month on average obtaining their coupon benefits. That time was saved under EBT. Dealing with problems took much less time than obtaining benefits and decreased under EBT. A small portion of the time spent resolving problems was by telephone. When recipient time is valued at the minimum wage of \$4.25 per hour, the time cost is \$5.99 per case month under coupon issuance and \$0.73 under EBT, a saving of \$5.26. Much of the cost of resolving problems under the coupon system can be attributed to the newly-implemented CRIS-E system in Montgomery County. It is likely that the more moderate time costs experienced in Franklin County represent the steady-state costs of participation under the CRIS-E coupon issuance system. Assuming under a steady state that the baseline costs in Montgomery County would have been no higher than those in Franklin County, the savings to recipients under EBT would have been approximately \$3.14 per month.

Exhibit 3-4

**MONTHLY RECIPIENT COSTS OF
OBTAINING FOOD STAMP BENEFITS**

BASELINE TIME COSTS

	<u>Montgomery County</u>	<u>Franklin County</u>
Hours spent obtaining benefits		
Travel	0.60	0.51
Time in office	0.64	0.32
Hours spent dealing with problems		
By telephone	0.02	0.01
In-person in welfare office	0.10	0.04
Travel time	0.05	0.03
Hours spent obtaining training		
Travel	N/A	N/A
Time in training	N/A	N/A
Total hours spent per month	1.41	0.91
Value of time (@ \$4.25/hour)	\$5.99	\$3.87

Source: Baseline recipient interviews.

N/A = Not Applicable

Exhibit 3-5

**MONTHLY RECIPIENT COSTS OF OBTAINING
FOOD STAMP BENEFITS**

FOLLOW-UP TIME COSTS

	<u>Montgomery County</u>	<u>Franklin County</u>
Hours spent obtaining benefits		
Travel	N/A*	0.48
Time in office	N/A*	0.26
Hours spent dealing with problems		
By telephone	0.01	0.01
In-person in welfare office	0.05	0.02
Travel time	0.05	0.03
Hours spent obtaining training		
Travel	0.02	N/A
Time in training	0.04	N/A
Total hours spent per month	0.17	0.80
Value of time (@ \$4.25/hour)	\$0.73	\$3.41

Note: * Time spent obtaining benefits was not applicable to Montgomery County as benefits were down-loaded to the recipient's card during the course of an ordinary shopping trip.

Source: Follow-up recipient interview.

N/A = Not Applicable

Opportunity Costs

Exhibit 3-6 details the components of opportunity costs experienced by recipients under coupon and EBT issuance. For most components, recipients incurred much lower opportunity

costs under EBT. The total monthly saving, on average, was \$4.07. Major savings came from reduced cost of under-issuances, delayed issuances, and stolen and lost benefits. With respect to under-issuances, Exhibit 3-7 shows that the reduced opportunity costs resulted from fewer recipients experiencing that problem fewer times and from prompt correction of the problem in a greater proportion of instances.

Exhibit 3-6

**MONTHLY RECIPIENT COSTS OF
OBTAINING FOOD STAMP BENEFITS**

OPPORTUNITY COSTS*

	<u>Montgomery County</u>	<u>Franklin County</u>
<u>Baseline</u>		
Receiving less than full allotment	\$1.34	\$0.88
Benefits not available on time	1.69	0.37
Benefits stolen	1.11	1.83
Benefits lost	1.09	0.44
Coupon/card damaged	0.19	0.09
Account charged for groceries not received	N/A	N/A
Deducted more from card than supposed to	N/A	N/A
Total	\$5.43	\$3.61
<u>Follow-up</u>		
Receiving less than full allotment	\$0.36	\$0.65
Benefits not available on time	0.54	0.12
Benefits stolen	0.10	1.83
Benefits lost	0.22	0.36
Coupon/card damaged	0.07	0.17
Account charged for groceries not received	0.05	N/A
Deducted more from card than supposed to	0.02	N/A
Total	\$1.36	\$3.13

Note: * Assumes interest rate of 18 percent.

Source: Baseline and follow-up recipient interviews.

N/A = Not Applicable

Exhibit 3-7

RECIPIENT ISSUANCE PROBLEMS
RECEIVED LESS THAN FULL ALLOTMENT

	Montgomery County		Franklin County	
	Baseline	Follow-up	Baseline	Follow-up
Percent with problem (BASE)	8 (788)	5 (812)	7 (848)	6 (766)
Mean number of times (BASE)	2.0 (61)	1.5 (42)	1.8 (56)	1.9 (44)
Mean amount not received (BASE)	\$59.70 (59)	\$69.50 (42)	\$83.00 (54)	\$50.20 (44)
Percent had problem corrected (BASE)	38 (58)	61 (38)	50 (52)	56 (41)
Mean days taken to correct (BASE)	13.9 (21)	7.3 (23)	9.7 (23)	14.7 (23)

Source: Baseline and follow-up recipient interviews.

BASE = Number of respondents who answered the question.

Costs attributable to benefits not being available on time were experienced by a smaller percentage of recipients under EBT (Exhibit 3-8). The mean number of occurrences and the amounts of benefits involved were also smaller under EBT, although the number of days to correct the problem rose somewhat.

Exhibit 3-8
RECIPIENT ISSUANCE PROBLEMS
BENEFITS NOT AVAILABLE ON TIME

	Montgomery		Franklin	
	County	Baseline	County	Baseline
Percent with problem (BASE)	24 (787)	14 (813)	5 (848)	4 (767)
Mean number of times (BASE)	2.0 (183)	1.6 (114)	2.1 (44)	1.4 (34)
Mean amount not received (BASE)	\$177.10 (173)	\$155.40 (114)	\$190.10 (41)	\$165.40 (34)
Percent had problem corrected (BASE)	91 (182)	92 (112)	88 (43)	85 (33)
Mean days taken to correct (BASE)	3.0 (166)	3.6 (103)	1.9 (38)	3.3 (28)

Source: Baseline and follow-up recipient interviews.

BASE = Number of respondents who answered the question.

Exhibit 3-9 shows that the cost incurred by recipients whose coupons or cards were stolen was less under EBT for two significant reasons. First, the average amount of benefits left on the card when stolen was about \$70 less than the average value of coupons stolen. That probably results from the fact that benefits are loaded onto the card as the initial step of what is typically the first purchase transaction of the month and are then immediately debited for the amount of the purchase. With coupons, the entire allotment is at risk from the time of issuance until the recipient begins spending them. Second, because the benefits on the EBT card are protected by the PIN, 90 percent of the recipients whose cards were stolen had the cards replaced with the

unused benefits restored. Their only opportunity cost derived from the period of three days it took on average to have the benefits restored. The other 10 percent of recipients whose cards were reported stolen did not attempt to get a replacement card or tried, but did not succeed. From interview data it is not possible to tell if benefits on the stolen cards were used by unauthorized persons.

Exhibit 3-9

PROBLEMS AFTER ISSUANCE

FOOD STAMP BENEFITS STOLEN

	Montgomery County		Franklin County	
	<u>Baseline</u>	<u>Follow-up</u>	<u>Baseline</u>	<u>Follow-up</u>
Percent with card/coupons stolen (BASE)	4 (810)	3 (814)	5 (876)	5 (788)
Mean number of times (BASE)	1.3 (32)	1.1 (21)	1.4 (45)	1.5 (40)
Mean amount involved (BASE)	\$120.70 (31)	\$49.80 (21)	\$132.00 (44)	\$166.80 (40)
Percent had card replaced (BASE)	N/A	90 (20)	N/A	N/A
Number of days to replace (BASE)	N/A	3.0 (18)	N/A	N/A

Source: Baseline and follow-up recipient interviews.

BASE = Number of respondents who answered the question.

N/A = Not Applicable

Exhibit 3-10 shows similar information for recipients who lost their coupons or EBT cards. As with stolen benefits, the mean amount involved with EBT card losses was smaller than with lost coupons, and nearly all those who reported card losses (94 percent) had their cards replaced. The incidence of loss was higher with cards (9 percent) than with coupons (4 percent).

Exhibit 3-10

PROBLEMS AFTER ISSUANCE

FOOD STAMP BENEFITS LOST

	Montgomery County		Franklin County	
	<u>Baseline</u>	<u>Follow-up</u>	<u>Baseline</u>	<u>Follow-up</u>
Percent losing benefits (BASE)	4 (810)	9 (814)	3 (876)	2 (788)
Mean number of times (BASE)	1.4 (33)	1.2 (75)	1.2 (26)	1.3 (19)
Mean amount involved (BASE)	\$100.50 (33)	\$73.20 (75)	\$72.00 (20)	\$72.80 (19)
Percent had card replaced (BASE)	N/A	94 (68)	N/A	N/A
Number of days to replace (BASE)	N/A	3.0 (64)	N/A	N/A

Source: Baseline and follow-up recipient interviews.

BASE = Number of respondents who answered the question.

N/A = Not Applicable

Exhibit 3-11 shows the incidence of recipients' having benefits they could not use because the card or coupons were damaged beyond use.

Exhibit 3-11

PROBLEMS AFTER ISSUANCE

CARD/COUPONS DAMAGED

	Montgomery County		Franklin County	
	<u>Baseline</u>	<u>Follow-up</u>	<u>Baseline</u>	<u>Follow-up</u>
Percent damaged card/coupons (BASE)	3 (807)	12 (812)	1 (876)	2 (788)
Mean number of times (BASE)	1.6 (24)	1.1 (97)	1.5 (13)	1.7 (19)
Mean amount involved (BASE)	\$26.30 (24)	\$88.50 (97)	\$32.60 (13)	\$31.40 (19)
Percent had benefits replaced (BASE)	17 (24)	96 (94)	17 (12)	16 (19)
Number of days to replace (BASE)	0 (4)	2.6 (90)	2 (2)	2.3 (3)

Source: Baseline and follow-up recipient interviews.

BASE = Number of respondents who answered the question.

Problems Encountered Obtaining and Using Benefits

The evaluation addressed how the demonstration system affects the ease, timeliness, and accuracy with which recipients receive their benefits. It was anticipated that during implementation and full operation of the demonstration, recipients might experience changes in the timeliness and accuracy of the benefits issued to them. Receiving the wrong amount, receiving benefits late, or having other problems in getting benefits would adversely affect

recipients. The EBT system may improve the delivery of benefits to reduce such problems. This section presents problems that recipients reported in receiving, retaining, and using their FSP benefits.

Accuracy and Timeliness of Benefit Issuance

Very few recipients in either county reported receiving more than their full allotment of benefits (EBT or coupons; see Exhibit 3-12). A slightly more common problem was receiving *less* benefits than they were entitled to. This problem occurred at about the same frequency in the follow-up survey among the two issuance systems: five percent in Montgomery County; six percent in Franklin County (Exhibit 3-13). It is not clear that these were actual issuance errors since the data are based on recipients' perceptions.

Exhibit 3-12
RECIPIENT ISSUANCE PROBLEMS
RECEIVED MORE THAN FULL ALLOTMENT

	Montgomery County		Franklin County	
	<u>Baseline</u>	<u>Follow-up</u>	<u>Baseline</u>	<u>Follow-up</u>
Percent with problem (BASE)	1 (788)	2 (813)	1 (847)	1 (767)
Mean number of times (BASE)	1.8 (10)	1.1 (15)	1.5 (10)	1.2 (6)
Mean extra amount received (BASE)	\$154.90 (10)	\$54.20 (15)	\$24.40 (10)	\$9.50 (6)
Percent had problem corrected (BASE)	80 (10)	77 (13)	70 (10)	67 (6)
Mean days taken to correct (BASE)	18.0 (7)	8.7 (10)	20.3 (3)	20.0 (4)

Source: Baseline and follow-up recipient interviews.

BASE = Number of respondents who answered the question.

Overall, about one in eight participants reported receiving their benefits late at least once, i.e., benefits were unavailable on the designated date. This occurred more commonly among EBT recipients than coupon recipients in the follow-up survey: 14 percent vs. four percent. The mean amount credited late was about the same: \$155 in Montgomery County and \$165 in Franklin County. In most cases, the problem was corrected -- 92 percent of the time in Montgomery County and 85 percent in Franklin County -- and usually (82 percent of the time) within three days (Exhibit 3-8).

Exhibit 3-13

RECIPIENT ISSUANCE PROBLEMS
RECEIVED LESS THAN FULL ALLOTMENT

	Montgomery County		Franklin County	
	<u>Baseline</u>	<u>Follow-up</u>	<u>Baseline</u>	<u>Follow-up</u>
Percent with problem (BASE)	8 (788)	5 (812)	7 (848)	6 (766)
Mean number of times (BASE)	2.0 (61)	1.5 (42)	1.8 (56)	1.9 (44)
Mean amount net received (BASE)	\$59.70 (59)	\$69.50 (42)	\$83.00 (54)	\$50.20 (44)
Percent problem-corrected (BASE)	38 (58)	61 (38)	50 (52)	56 (41)
Mean days taken to correct (BASE)	13.9 (21)	7.3 (23)	9.7 (23)	14.7 (23)

Source: Baseline and follow-up recipient interviews.

BASE = Number of respondents who answered the question.

Security of Benefits

Electronic benefits transfer is often described as being more secure than using paper coupons. When paper coupons are lost or stolen, they are not replaced; recipients lose the value of the lost or stolen benefits. Under the off-line EBT system, when recipients report their card lost or stolen, the system locks out that card so that no further benefits can be spent from it. Upon request, recipients get the card replaced with the unspent balance of benefits restored. As long as recipients do not share their PINs or write them on the cards, it should be very difficult for unauthorized persons to transact the lost or stolen cards. Recipients should be able to recover their benefits fully on most occasions of loss.

Few recipients reported that their card/coupons had been stolen, lost, or damaged beyond use (Exhibits 3-9, 3-10, and 3-11). Stolen benefits were equally uncommon in the two counties (3-5 percent), although the average amount of coupon benefits reported stolen in the follow-up survey was greater than the amount of electronic benefits stolen: \$167 vs. \$50. In the follow-up survey, lost cards were more common than lost coupons: 9 percent vs. 2 percent. PayEase cards were also more likely to be damaged than coupons: 12 percent vs. 2 percent. In almost every case (96 percent) of a damaged card, the card was replaced while only 16 percent of those with damaged coupons said that they were replaced. It took three days, on the average, to replace stolen, lost, or damaged PayEase cards.

Problems of Benefits Usage

One concern about using electronic benefits cards in grocery shopping is that recipients will sometimes have fewer dollars of benefits remaining on their card than they expect. The more abstract nature of electronic benefits compared to coupons may make it harder for some recipients to keep track of their balances. This concern was largely unfounded in the use of off-line EBT benefits (Exhibit 3-14): only nine percent of recipients had less in their account than expected on any occasion. Despite the relatively low incidence of the problem, it is substantially higher than the incidences reported for on-line systems in New Mexico and Ramsey County (one and three percent, respectively). Of those who did experience having less than expected in their accounts, 43 percent (about 4 percent of all recipients) attributed it to difficulty keeping track of

how much they had spent; 9 percent (less than 1 percent of all recipients) to unauthorized use of their card; 29 percent (about 3 percent of all recipients) to having been charged for groceries not purchased, and 27 percent (about 3 percent of all recipients) to the store deducting more than it should have. Ten percent of those experiencing the problem named other reasons.

Exhibit 3-14
PROBLEMS AFTER ISSUANCE
PERCENT REPORTING PROBLEM

	<u>Montgomery</u> <u>County</u>	<u>New</u> <u>Mexico</u>	<u>Ramsey</u> <u>County</u>
<u>Had less in account than expected</u>			
One or more times	9	1	3
Never	91	99	97
(BASE)	(814)	(73)	(71)
<u>Reasons for having less in account than expected*</u>			
Had trouble keeping track of how much you spent	43	--	--
Someone else used the card without your knowledge	9	--	--
Charged by mistake for groceries not purchased	29	--	--
Store deducted more from account than supposed to	27	--	--
Other reason	10	--	--
(BASE)	(75)	--	--

Note: * Multiple reasons were allowed. The sum of the percents exceeds 100 percent.

Source: Follow-up recipient interviews.

BASE = Number of respondents who answered the question.

"--" Indicates coding category was not used.

Nearly all participants reported keeping track of their account balance by retaining their purchase receipts (96 percent) (Exhibit 3-15). Only one percent objected to having the balance printed on the receipt. About one-half (48 percent) had also used the store equipment available for account balance inquiries. Many of them reported using this method regularly. Few recipients reported having called the PayEase customer service number for a balance inquiry.

Exhibit 3-15

METHODS OF KEEPING TRACK OF EBT ACCOUNT BALANCE (Montgomery County Only)

	Methods <u>Used</u> <u>Percent</u>	Main <u>Method</u> <u>Percent</u>
<u>Methods of Keeping Track of Balance</u>		
Keeping receipts showing balance ^a	96	90
Using equipment at check-out or service desk ^b	48	5
Using home phone to call PayEase customer service	3	3
Using other phone to call PayEase customer service	3	--
Calling welfare office	1	--
(BASE)	(814)	(813)

Notes: ^a Only 1 percent said they would prefer not having the account balance printed on the receipt.

^b 36 percent of all recipients said they check the account balance using a terminal almost every time before using the card.

Source: Follow-up recipient interviews.

BASE = Number of respondents who answered the question.

-- Indicates coding category was not used.

A possible negative consequence of having fewer benefits than expected is having to return grocery items while at the check-out counter. This can slow the flow of traffic through

the check-out line and be embarrassing to the recipient. About one in eight EBT recipients (12 percent) had to return items on at least one shopping trip in the last 6 months (Exhibit 3-16), and more than half of those shoppers (51 percent) had to return items more than once (mean = 2.5 times). Coupon users had to return items because they did not have enough coupons somewhat more frequently (16-22 percent with mean = 2.9 times). These results suggest that the EBT system with printed account balances on receipts and balance inquiry terminals in stores is effective in helping recipients know the amount of benefits remaining.

Exhibit 3-16

PROBLEMS AFTER ISSUANCE

**HAD TO RETURN GROCERY ITEMS WHILE AT CHECK-OUT COUNTER
BECAUSE NOT ENOUGH BENEFITS/FOOD STAMP COUPONS**

	Montgomery County		Franklin County	
	Baseline Percent	Follow-up Percent	Baseline Percent	Follow-up Percent
Had to return items	21	12	16	22
(BASE)	(810)	(812)	(873)	(788)
<u>Number of times had to return items</u>				
Once	31	49	26	28
Twice	35	15	34	31
Three times	12	14	15	18
More than three times	21	22	24	24
Mean	3.1	2.5	2.9	2.9
(BASE)	(167)	(95)	(140)	(170)

Source: Follow-up recipient interviews.

BASE = Number of respondents who answered the question.

There is also no evidence in this evaluation that use of an electronic benefits card promotes overcharging of customers, as only 10 percent of the EBT shoppers reported being overcharged for groceries, compared to 15 percent of those who paid with coupons (Exhibit 3-17). The number of times food stamp purchasers were overcharged and the amount of the

overcharge were also slightly higher among coupon shoppers than EBT shoppers. In each of the groups, most reached a satisfactory resolution with the store after being overcharged, although the coupon users in Franklin County were somewhat more likely to be pleased with the outcome than the EBT recipients in Montgomery County, 99 to 89 percent.

Exhibit 3-17

PROBLEMS AFTER ISSUANCE

OVERCHARGED WHEN GROCERY SHOPPING

	Montgomery County		Franklin County	
	Baseline Percent	Follow-up Percent	Baseline Percent	Follow-up Percent
<u>Perceived overcharged</u>				
Yes (BASE)	14 (810)	10 (814)	12 (874)	15 (788)
<u>Number of times overcharged</u>				
Once	37	55	44	46
Twice	27	28	30	24
More than twice	36	17	26	29
Mean (BASE)	3.4 (116)	2.2 (78)	2.2 (112)	2.6 (116)
Last amount overcharged (mean \$)	\$6.00	\$5.50	\$6.70	\$7.40
<u>Resolution of overcharge</u>				
Given cash	23	21	20	18
Given PayEase credit/food stamps	29	28	43	44
Given store credit	14	19	9	10
Overcharge not refunded	33	29	26	28
Have PayEase card but given stamps (BASE)	N/A (115)	3 (78)	N/A (101)	N/A (116)
<u>Satisfaction with resolution</u>				
Yes No (BASE)	90 10 (77)	89 11 (55)	95 5 (75)	99 1 (83)

Source: Follow-up recipient interviews.

BASE = Number of respondents who answered the question.

N/A = Not Applicable

EBT system recipients did encounter system problems when using the card: 47 percent reported that the store computer or related equipment required to use the card was not working at least once (Exhibit 3-18) (mean = 2.8 times for those who said they experienced the problem). Thirty-eight percent indicated that the system worked very slowly, making it hard to get purchases authorized (mean = 5.0 times). Five percent were unable to get an account balance at least once. One in nine forgot their PIN at least once. Approximately 10 percent of the EBT recipients encountered situations in which the store had to do a manual transaction because of system slowness or equipment failure. Recipients who experienced system problems were divided in their opinion of how much of a problem it was.

Compared to on-line EBT systems in New Mexico and Ramsey County, recipients using off-line EBT reported somewhat more instances of equipment not working and substantially more instances of the system working slowly. They also reported more instances of forgetting their PIN. More recipients using on-line systems reported stores' having to do manual transactions than did recipients under off-line EBT.

Exhibit 3-18

PROBLEMS USING EBT CARD

	<u>Montgomery</u> <u>County</u> <u>Percent</u>	<u>New</u> <u>Mexico</u> <u>Percent</u>	<u>Ramsey</u> <u>County</u> <u>Percent</u>
<u>Problems Using EBT Card</u>			
Store computer/equipment not working	47	44	31
System working slowly	38	12	20
Forgotten PIN	11	6	7
Unable to find out account balance	5	11	8
Had to get new PIN	4	--	--
Store had to do manual transaction	10	25	17
(BASE)	(814)	(73)	(71)

Source: Follow-up recipient interviews.

BASE = Number of respondents who answered the question.

"--" Indicates coding category was not used.

Some stores participating in the demonstration, primarily those in the fringe area or stores with a lower food stamp volume, had only some of their check-out lanes equipped with EBT system equipment (26 percent of retailers reported that they did not have all lanes equipped). The majority of recipients (59 percent) had shopped in a store that was only partially equipped (Exhibit 3-19). One-quarter of those shoppers experienced difficulty knowing which lanes accepted PayEase cards; approximately one in six (16 percent) said they felt awkward or embarrassed using the specially equipped lanes; and nearly half (45 percent) reported that the wait was longer in the PayEase lane.

Exhibit 3-19

**EXPERIENCES IN PARTIALLY EQUIPPED STORES
(Montgomery County Only)**

	<u>Percent</u>
Shopped in partially equipped store (BASE)	59 (814)
Had difficulty knowing which lanes accept PayEase (BASE)	25 (480)
Felt awkward/embarrassed using special lane (BASE)	16 (480)
Waited longer in PayEase lane (BASE)	45 (480)

Source: Follow-up recipient interviews: Some stores do not have a PayEase machine in every check-out lane. Have you ever shopped in a store in which only some lanes were equipped to accept the PayEase card? When shopping in a partially equipped store, have you ever ...?

BASE = Number of respondents who answered the question.

Benefit recipients in both counties were asked to name the single biggest problem in using the card/coupons. A larger proportion of the EBT recipients, compared to coupon users, reported having a problem: 45 percent vs. 16 percent (Exhibit 3-20). The most common problem mentioned related to computer system breakdown or slowness, named by 19 percent of the EBT recipients. No other problem was mentioned by as many as five percent. While more of the Montgomery County respondents named a problem, compared to the recipients in Franklin County, the Montgomery County EBT recipients were also more likely to say that the situation regarding the problem had improved: 28 percent said it had "gotten better" versus 10 percent who said it had "gotten worse"; in Franklin County, the corresponding figures were 18 percent and

17 percent, respectively (Exhibit 3-21). Apparently recipients were reacting to slowness and breakdowns of the system that occurred in the first two months, and recognized that system performance had improved since that time.

Exhibit 3-20

**BIGGEST PROBLEMS WITH FOOD STAMP COUPONS/
PAYEASE CARD***

**(Problems Mentioned by at Least 2 Percent
in Either County)**

<u>Biggest Problems</u>	<u>Montgomery County</u> <u>Follow-up Percent</u>	<u>Franklin County</u> <u>Follow-up Percent</u>
No problems	55	84
Computer breakdown/closing down/too slow	19	1
Benefits activated late/unsure of when	4	N/A
PayEase not widely accepted/location	4	N/A
PayEase terminals slow	3	N/A
Entering card in terminal/card rejected	3	N/A
Using/remembering PIN	2	N/A
The wait/lines too long	2	5
Amount received/don't get enough	0	2
(BASE)	(811)	(786)

Note: * Multiple responses allowed.

Source: Follow-up recipient interviews: Of the problems with the PayEase card/food stamp coupons that we have discussed, what is the one biggest problem in your opinion?

BASE = Number of respondents who answered the question.

N/A = Not Applicable

Exhibit 3-21

CHANGE IN BIGGEST PROBLEM MENTIONED

<u>Change in Biggest Problem</u>	<u>Montgomery County Follow-up Percent</u>	<u>Franklin County Follow-up Percent</u>
Gotten better	28	18
Gotten worse	10	17
Stayed the same	62	66
(BASE)	(344)	(119)

Source: Follow-up recipient interviews: In the past (number of months), has this problem gotten better, worse, or stayed about the same?

BASE = Number of respondents who answered the question.

Recipient Perceptions of Benefit Security and Program Integrity

Recipients who use EBT and those who use coupons feel about equally secure against threats of loss or theft of their benefits. Six percent of the PayEase card users in the test site do not feel secure versus four percent of the coupon users in the comparison site. The percentage of recipients who do not feel secure with their benefits decreased from baseline to follow-up in both sites (Montgomery County: 8 percent in the baseline, 6 percent follow-up versus Franklin County: 9 percent baseline, 4 percent follow-up) (Exhibit 3-22). Among the small minority who do not feel secure, the source of the feeling among card-holders tends to be more fear of losing or damaging the card; among the coupon program participants, the source of insecurity is largely fear of having the coupons stolen.

One of the anticipated benefits of EBT is its potentially greater security against benefit diversion and fraud. Diversion is the use of benefits to purchase other than eligible food items. Fraud is a broad classification of illegal activities that convert benefits to cash through trafficking or other means.

Exhibit 3-22

**RECIPIENT PERCEPTIONS REGARDING
CARD/COUPON SECURITY**

<u>Security</u>	Montgomery County		Franklin County	
	<u>Baseline Percent</u>	<u>Follow-up Percent</u>	<u>Baseline Percent</u>	<u>Follow-up Percent</u>
Percent not secure with card/coupons	8	6	9	4
(BASE)	(802)	(811)	(868)	(786)
<u>Reasons Not Secure</u>				
Can be stolen	68	28	81	92
Easy to lose	55	56	43	24
Can be damaged	8	26	10	--
Other	10	20	16	8
(BASE)	(60)	(50)	(77)	(25)

Source: Baseline and follow-up recipient interviews: Do you feel secure with your PayEase card/food stamp coupons?

BASE = Number of respondents who answered the question.

-- Indicates coding category was not used.

Recipients believe it is harder to buy ineligible items with EBT than with coupons. In the baseline survey, 55 percent said it would be "very hard" to purchase ineligible items with coupons. In the follow-up survey, 64 percent of recipients said it would be "very hard" to buy ineligible items with electronic benefits. With EBT, 37 percent said it would be "very hard" to trade benefits for cash, while only 14 percent said it was "very hard" to trade coupons for cash (Exhibit 3-23). Most respondents in the baseline survey said it was relatively easy to trade benefits (coupons) for cash; most in the follow-up survey felt that it was relatively difficult to trade EBT benefits for cash.

Exhibit 3-23

**RECIPIENT PERCEPTIONS REGARDING BENEFIT DIVERSION
AND FRAUD**

	Montgomery County		Franklin County	
	<u>Baseline Percent</u>	<u>Follow-up Percent</u>	<u>Baseline Percent</u>	<u>Follow-up Percent</u>
<u>Ease of Buying Ineligible Items</u>				
Very hard	55	64	65	57
Somewhat hard	17	14	10	16
Somewhat easy	8	4	4	6
Very easy	9	5	7	8
Don't know	11	13	14	13
(BASE)	(810)	(814)	(876)	(788)
<u>Ease of Trading for Cash</u>				
Very hard	14	37	35	15
Somewhat hard	10	17	9	10
Somewhat easy	18	15	10	14
Very easy	41	18	30	42
Don't know	17	13	17	19
(BASE)	(810)	(814)	(876)	(788)
Mean value of benefits traded for cash	\$0.57	\$0.50	\$0.56	\$0.51
(BASE)	(353)	(290)	(273)	(319)

Source: Baseline and follow-up recipient interviews: How easy do you think it would be for a food stamp recipient to use the food stamp benefits on the PayEase card/food stamp coupons to buy items other than eligible food items -- items such as tobacco, alcohol, or other products? Do you think it would be ...? What about trading food stamp benefits on the PayEase card/food stamp coupons for cash? If a food stamp recipient wanted to do this, do you think it would be ...? And if someone traded PayEase food stamp benefits/food stamp coupons for cash, how much cash do you think they could get for each dollar of food stamp benefits?

BASE = Number of respondents who answered the question.

Recipients were asked to estimate the street value of benefits to traffickers who buy and resell benefits for a profit. In the baseline survey, recipients estimated that a person selling benefits for cash could get \$0.57 per dollar of benefits. Under EBT, they estimated that the seller could get \$0.50 per dollar of benefits. The lower price suggests that EBT offers more of a barrier to trafficking: as the difficulty of converting benefits to cash and the risk of detection increase, the value of the benefits on the street should decline.

Treatment by Store Employees

The method of payment for grocery items (card vs. coupons) does not appear to affect recipients' perceptions of how they are treated by store employees (Exhibit 3-24). Large majorities of participants in both counties believe that they are treated the same as other customers.

Exhibit 3-24

**RECIPIENT PERCEPTIONS REGARDING TREATMENT
BY STORE EMPLOYEES**

	Montgomery County		Franklin County	
	<u>Baseline Percent</u>	<u>Follow-up Percent</u>	<u>Baseline Percent</u>	<u>Follow-up Percent</u>
<u>Treatment by Store Employees</u>				
Better than other customers	3	4	1	1
About the same as others	86	84	90	87
Worse than others	11	12	9	12
(BASE)	(810)	(808)	(863)	(787)
Felt awkward or embarrassed using benefits	14	15	13	10
(BASE)	(809)	(813)	(875)	(788)

Source: Baseline and follow-up recipient interviews: Do you think that food store employees treat PayEase card/food stamp coupon users better, about the same, or worse than other customers who do not use a PayEase card/food stamp coupons to make food purchases? In the past (number of months) have you ever felt awkward or embarrassed when using your PayEase card/food stamp coupons to buy groceries?

BASE = Number of respondents who answered the question.

Direct Comparisons by Recipients of Coupons vs. Electronic Benefits Transfer

What are the effects of the demonstration on the recipients' perceptions of the FSP and of EBT compared to the coupon issuance system?

FNS has indicated that maintaining client satisfaction is an important goal. To assess whether recipients have strong preferences for one form of benefit issuance over another, the surveys included questions on perceptions of, and opinions about, the two systems. Specific aspects of the EBT system about which recipients report having problems or that are especially disliked relative to coupon issuance may indicate a need for system redesign.

Montgomery County follow-up survey participants who had earlier received food stamp coupons were asked to compare the two systems on a number of factors. By a margin of 64 percent to 26 percent, recipients who had experienced both systems preferred electronic benefits (Exhibit 3-25). Forty-four percent of recipients felt that shopping was easier with EBT, compared with 22 percent who felt shopping with coupons was easier. The remaining 34 percent thought they were about the same. Recipients overwhelmingly reported that EBT required fewer (rather than more) trips to the welfare office, although about half reported the number of trips as being about the same.

Compared to on-line systems, the preference recipients show for off-line EBT over coupons is less favorable. While 64 percent favored the off-line system over coupons, 76 to 89 percent preferred the on-line systems over coupons in New Mexico and Ramsey County. That comparison should be viewed with recognition that the coupon issuance systems in place in Montgomery County and the two on-line sites were quite different.

Exhibit 3-25

RECIPIENTS' OPINIONS ABOUT EBT AND COUPONS
(Recipients Who Had Used Both Methods)

	<u>Montgomery</u> <u>County</u> <u>Percent</u>	<u>New</u> <u>Mexico</u> <u>Percent</u>	<u>Ramsey</u> <u>County</u> <u>Percent</u>
<u>Ease of Shopping</u>			
Easier with EBT	44	83	67
About the same	34	14	19
Harder with EBT	22	3	14
<u>Number of Calls/Visits to Welfare Office</u>			
More with EBT	7	--	--
About the same	46	--	--
Fewer with EBT	47	--	--
<u>Treatment by Store Employees</u>			
Better with EBT	10	--	--
About the same	82	--	--
Worse with EBT	8	--	--
<u>Overall Preference</u>			
EBT card	64	89	76
Coupons	26	3	19
Don't know	10	8	5
(BASE)	(710)	(64)	(63)

Source: Follow-up recipient interviews.

BASE = Number of respondents who answered the question.

-- Indicates coding category was not used.

EBT has several points of relative advantage (Exhibit 3-26):

- it is easier to know the account balance;
- coupons are lost and stolen more than the card;
- it is harder to sell benefits for cash with the card; and
- electronic benefits are more likely to be spent on food.

On the other hand, coupons were favored as being easier for children or friends to shop with.

Exhibit 3-26

PERCEPTIONS ABOUT EBT VERSUS COUPONS

<u>Perceptions about EBT</u>	Percent Agree or Strongly Agree	Percent Disagree or Strongly Disagree
Easier to know account balance with EBT card	70	18
Cards get lost more than coupons	23	61
Coupons get stolen more than cards	72	14
Quicker to pay with coupons than with cards	42	48
Treated better when paying with card	25	31
Spend more of benefits on food with coupons	28	47
Harder to sell benefits for cash with card	67	20
Easier to have child/friend shop with coupons	56	27
(BASE)	(710)	

Source: Follow-up recipient interviews with respondents who have used both the coupon and EBT systems: I'm going to read you some things people might say about the differences between using the new PayEase cards and using food stamp coupons. Please tell me whether you agree strongly, agree, neither agree nor disagree, disagree, or disagree strongly.

BASE = Number of respondents who answered the question.

Participants who preferred the EBT system were asked what they like better about it, and those preferring coupons were asked what they like better about coupons. The main reasons for liking the PayEase card (Exhibit 3-27) included: convenience or ease of use (mentioned by 33 percent), it is faster/no waiting in line (23 percent), there is no need to count coupons (21

percent), there is no need to carry coupons or stamp books (19 percent), it is safer (17 percent), no one else can use the card (10 percent), and it is easy to activate/to get benefits each month (11 percent). Other reasons were mentioned by fewer than 10 percent of those preferring EBT. For comparison, Exhibit 3-27 shows reasons recipients in the on-line demonstrations gave for preferring EBT over coupons. While the coding categories used were not identical across the two evaluations, the patterns of preference reasons are similar. For both on-line and off-line EBT systems, the principal reasons for preference were convenience and safety.

Exhibit 3-27

**REASONS RECIPIENTS LIKE EBT CARD
BETTER THAN FOOD STAMP COUPONS
(Percent Citing Specific Reasons)**

	<u>Montgomery County</u>	<u>New Mexico</u>	<u>Ramsey County</u>
Convenient/easy to use	33	81	69
Quicker (to pay with)	4	25	12
No waiting in line/faster	23	--	--
No trip to post office/welfare office	--	7	6
No counting coupons	21	--	--
No carrying coupons	19	--	--
Easy to activate/get benefits monthly	11	--	--
Safer than coupons/easier to replace card	17	23	31
No one else can use my card	10	--	--
Don't worry about losing	6	--	--
Less embarrassing	--	2	8
More privacy/personal	4	--	--
Easier to know balance	4	5	0
Less fraud/can't sell	2	--	--
No change given	--	5	0
Don't spend as much	2	--	--
Don't have to cash check	--	2	0
(BASE)	(448)	(57)	(48)

Source: Follow-up recipient interviews: What do you like better about the PayEase card?

BASE = Number of respondents who answered the question.

"--" Indicates coding category was not used.

Those preferring coupons (Exhibit 3-28) most often said: they are easy/easier to use (22 percent), you can use them at any store (15 percent), they are quicker or faster (15 percent), they are easier to keep track of (14 percent), you can get change back using coupons (14 percent), there are no computer problems (12 percent), there is no waiting for processing (10 percent), and it is more like using cash (10 percent). Other reasons were mentioned by fewer than 10 percent of recipients preferring coupons. The principal reasons for preferring coupons over the on-line systems were that coupons can be used in any store and that they are easy to keep track of.

Exhibit 3-28

**REASONS RECIPIENTS LIKE FOOD STAMP COUPONS
BETTER THAN EBT CARD
(Percent Citing Specific Reasons)**

<u>Reasons for Liking Coupons Better</u>	<u>Montgomery County Percent</u>	<u>New Mexico Percent</u>	<u>Ramsey County Percent</u>
Easy/just tear and use	22	0	8
Can use at any store	15	50	33
Quicker/faster process	15	--	--
Get change back	14	--	--
Easy to keep track of	14	50	33
No computer problems	12	--	--
No waiting for processing	10	--	--
More like using cash	10	--	--
Just like better/no hassles	7	--	--
Can send someone else to store	6	--	--
No long line at stores	4	--	--
No PIN to use	4	--	--
No waiting/easier to pick up	3	--	--
Card doesn't always work	3	--	--
Easy to spend too much with the card	2	--	--
(BASE)	(182)	(2)	(12)

Source: Follow-up recipient interviews: What do you like better about the coupons?

BASE = Number of respondents who answered the question.

"--" Indicates coding category was not used.

Montgomery County participants were also asked what, if anything, about the EBT system they would like to see changed. Only 133 of the 814 recipients questioned (16 percent) could offer any suggestions (Exhibit 3-29). The most common requests were to have a faster or updated computer system (26 percent), to have more stores accept the card (17 percent), and to

be able to have benefits credited on the 1st of each month or on some other day than currently credited (14 percent). Fourteen percent of respondents indicated that they preferred coupons; all other requests were made far less often.

Exhibit 3-29

SUGGESTED CHANGES

PERCENT MENTIONING SPECIFIC CHANGES

<u>Things Recipients Would Like to See Changed</u>	<u>Percent</u>
Faster/updated computer system	26
More stores/wider acceptance	17
Get benefits on 1st-not 5th/ different date	14
Prefer coupons	14
More activation locations	7
Better training needed	5
Make card more durable	5
More terminals at store	4
Get change back/no credit account	4
More "PayEase only" check-out lanes	3
Automatic activation	3
Bigger print on receipt	2
Help alleviate welfare stigmas	2
Improve welfare office telephone service	2
Speed up problem solving process	2
Make easier to use	2
(BASE)	(133)

Source: Follow-up recipient interviews: Is there anything you would like to see changed about the way the PayEase card works or the way you get information about food stamp benefits? What would you like to see changed?

BASE = Number of respondents who answered the question. Multiple mentions were allowed.

Shopping Patterns

Because retailers outside the demonstration area may not have participated in the demonstration, there was the potential that households would have to shop in different stores than they used previously. The retailers which the recipients had to use under the demonstration could have been less convenient for the recipients, and increased their transportation cost. Also, each recipient could name only three retailers in the demonstration area at which they could have benefit allotments posted to their cards at the beginning of the month. This could cause changes in recipient shopping patterns as well.

The demonstration involved new procedures for identification of account holders through the use of PINs. These might have affected the ease with which multiple shoppers from a household could access benefits. Shoppers need to enter the correct PIN at the time of purchase, and shoppers who forget their numbers or have trouble entering them are denied access to their benefits. Households that travel and wish to use their benefits outside the demonstration area were able to convert their benefits to coupons; however, this required a trip to a food stamp service center. This section addresses several issues related to whether recipients' basic shopping behavior is affected by participation in electronic benefits transfer.

Follow-up survey respondents in Montgomery County were somewhat less likely than their counterparts in Franklin County to do all of the shopping in the household (Exhibit 3-30). While this percentage remained stable in Franklin County from baseline to follow-up, it actually declined slightly in Montgomery County. This suggests that planned use of the EBT card by parties other than the primary shopper in the household might not be so much of a problem as to inhibit others who need to, to use the card. Nonetheless, although only one in nine follow-up survey households in Montgomery County experienced a problem when the non-primary shopper tried to use the PayEase card (11 percent), this figure is significantly higher than in Franklin County when a non-primary shopper tried to use coupons (1 percent).

Exhibit 3-30

**SHARE OF GROCERY SHOPPING BY PRIMARY PAYEASE/
FOOD STAMP COUPON SHOPPER**

<u>Primary Grocery Shopper Does ...</u>	Montgomery County		Franklin County	
	Baseline Percent	Follow-up Percent	Baseline Percent	Follow-up Percent
All of the shopping	78	73	79	83
More than half of the shopping	18	21	14	12
Half of the shopping	3	5	4	4
Less than half of the shopping	1	1	3	1
(BASE)	(805)	(813)	(870)	(786)
Problem(s) experienced by non-primary shopper using PayEase card/food stamps	5	11	1	1
(BASE)	(177)	(216)	(182)	(137)

Source: Baseline and follow-up recipient interviews: Does someone else (other than primary shopper) do the grocery shopping with the PayEase card/food stamp coupons? If so, how often do they do the grocery shopping? Has anyone who has used your PayEase card/food stamp coupons had any problems when shopping with it/them?

BASE = Number of respondents who answered the question.

EBT recipients made more shopping trips per month than coupon shoppers in the follow-up survey: 4.9 versus 3.4, on average (Exhibit 3-31). The changes from baseline to follow-up in the two counties provide evidence that use of EBT might increase the number of shopping trips: The average number of trips in Montgomery County increased from 3.8 to 4.9, while the figure in Franklin County declined slightly.

The types of stores where each group shopped were mostly the same in the two counties and did not change significantly between baseline and follow-up.

Exhibit 3-31

**FREQUENCY OF SHOPPING TRIPS WHEN PAYEASE CARD/
FOOD STAMP COUPONS USED AND
TYPE OF STORE WHERE SPEND MOST BENEFITS**

	Montgomery County		Franklin County	
	Baseline Percent	Follow-up Percent	Baseline Percent	Follow-up Percent
<u>Number of Trips per Month</u>				
One	19	12	21	27
Two	24	19	25	24
Three	15	17	16	15
Four	18	17	12	15
Five	8	9	7	4
Six	5	6	5	3
Seven or more	11	19	13	11
Don't know	0	1	1	1
Mean (BASE)	3.8 (810)	4.9 (814)	3.8 (876)	3.4 (788)
<u>Type of Store Where Most Benefits were Spent</u>				
Supermarkets	91	89	89	90
Smaller grocery store	6	9	7	6
Convenience stores	1	1	1	1
Other types	2	1	3	3
(BASE)	(810)	(812)	(863)	(788)

Source: Baseline and follow-up recipient interviews: In a typical month, how many times do you or does someone else use your PayEase card/food stamp coupons for grocery shopping? Remember to include even small shopping trips when the card/coupons are used to buy just a few items. In which type of store do you spend most of your food stamp benefits in a typical month?

BASE = Number of respondents who answered the question.

One in 11 EBT recipients (9 percent) reported having to change stores because the store where they wanted to shop did not accept payment by EBT (Exhibit 3-32). While most who had to change stores found this to be a problem, if the program is later adopted more widely within the region, the problem should be alleviated since many more stores would then be participating.

Exhibit 3-32

**RECIPIENT NEEDED TO FIND NEW PLACE TO SHOP
BECAUSE STORE DID NOT ACCEPT PAYMENT BY EBT**

	<u>Montgomery</u> <u>County</u> <u>Percent</u>	<u>New</u> <u>Mexico</u> <u>Percent</u>	<u>Ramsey</u> <u>County</u> <u>Percent</u>
<u>Need to Change Stores?</u>			
Yes	9	7	4
No	91	93	96
(BASE)	(814)	(73)	(71)
<u>How Big a Problem?</u>			
Big problem	39	N/A	N/A
Little problem	33	N/A	N/A
No problem	28	N/A	N/A
(BASE)	(72)	N/A	N/A

Source: Follow-up recipient interviews: Since you started using the PayEase card, has it been necessary for you to change stores in which you do your grocery shopping because your old store does not accept the PayEase card? Was changing stores a big problem, a little problem, or no problem?

BASE = Number of respondents who answered the question.

N/A = Not Applicable

Participation in the Food Stamp Program

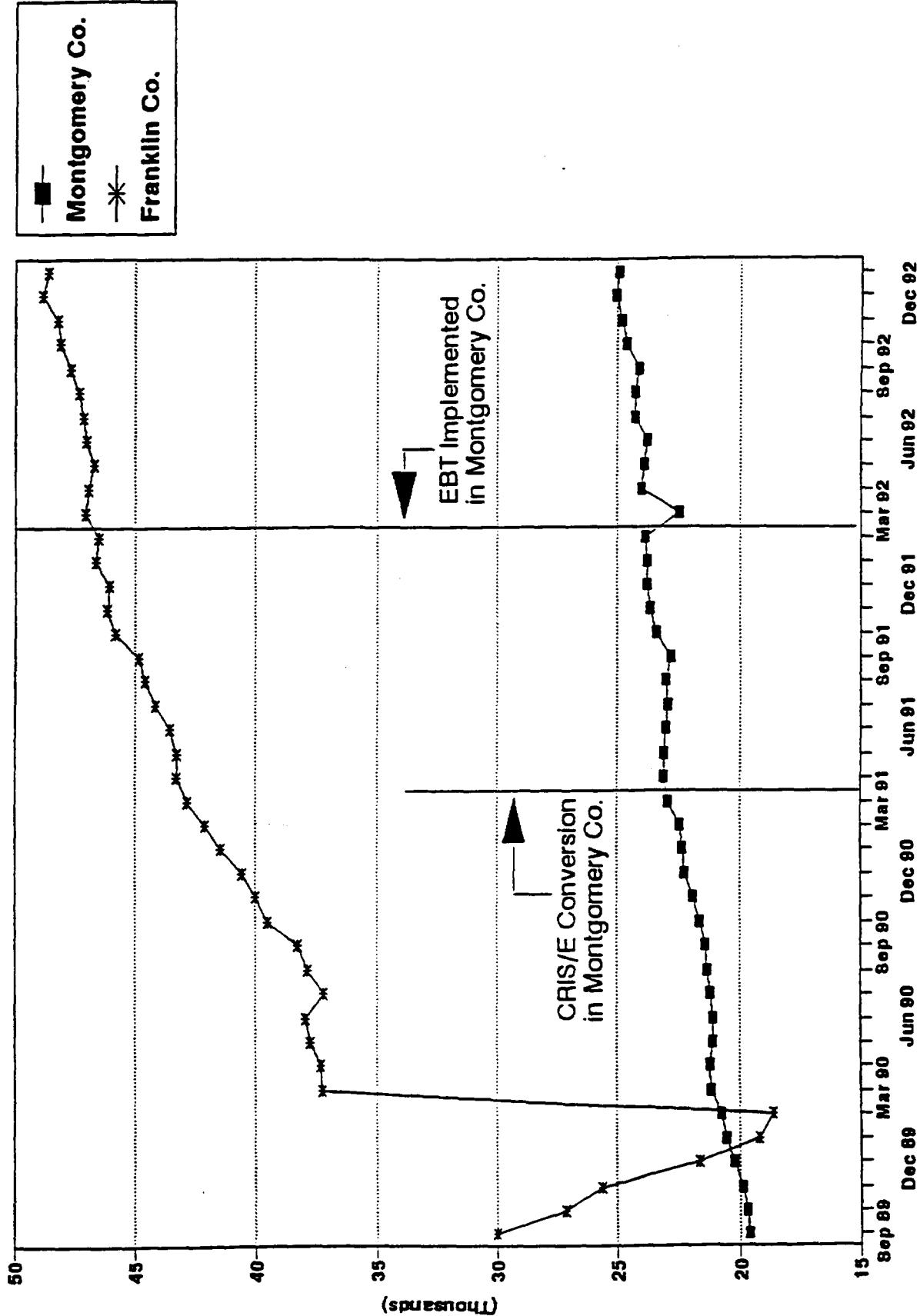
When EBT replaced coupon issuance in Montgomery County, the new form of benefit may have been attractive to people who had avoided participating in the FSP for fear of embarrassment at having to use coupons. Further, the publicity surrounding the EBT demonstration could have aroused interest and brought additional households into the program. On the other hand, the technology used, the training required, and the more abstract benefit form with EBT may have discouraged some people from participating. The net effect of these factors could have been to change the level of participation, and that could have led to additional costs to FNS, Ohio, and Montgomery County for benefits and caseload management.

To explore the possible impacts of EBT on participation, an interrupted time series analysis was performed on participation data obtained from the Ohio Department of Human Services. The data set contained the number of public assistance (PA) and non-public assistance (NPA) food stamp households in each county in Ohio for 41 months beginning in September 1989 and extending through December 1992. The time series of participation data extended across the period in which conversion to CRIS-E and the implementation of EBT occurred in Montgomery County and throughout the period of stable operation. The data for all other counties allowed the construction of multiple control series to help in interpreting the patterns of change in the Montgomery County time series. Appendix G presents a detailed discussion of the data sources and analytic methods used in this analysis.

Exhibit 3-33 shows the time series for Montgomery and Franklin Counties for total monthly FSP participation. The series for Montgomery County is remarkable for its smoothness and stability over time. Visual inspection reveals no change in slope or intercept that would signal an impact of EBT. The small dip in March 1992 coincides with the first EBT issuances and is likely a data error since the next month's participation returned to the trend line. Participation in Franklin County, meanwhile appears to have a decelerating pattern of increase in participation.

Exhibit 3-33

TOTAL FSP PARTICIPATION (Montgomery and Franklin Counties)



Total Monthly FSP Participation

A time series for all other counties in Ohio appears in Appendix G along with series that include only NPA households. It was expected that the NPA caseload might show more responsiveness to EBT than the more structural participation of PA households. An anomaly in the way general assistance cases were categorized by Ohio caused the NPA series to jump wildly just at the point EBT was introduced in Montgomery County. As a result, the analysis presented here is based on total food stamp participation.

The interrupted time series analysis is shown in Exhibit 3-34. A statistical analysis of the Montgomery County time series with an interrupt at the point EBT issuance began confirmed what visual inspection suggests: the slope did not change, although there was a slight downward change in the intercept. The intercept change can be interpreted as a reduction in the number of participating households from the level that would have been predicted from the baseline time series. The reduction of 589 households, or about 3 percent of the caseload, is consistent with other similar reductions in Franklin County and throughout Ohio where EBT was not implemented. It is likely that the change in Montgomery County reflects a general trend and not an impact of EBT. The lack of change in slope means that there is no evidence in the data that EBT accelerated the rate at which additional households are added to the FSP. These results, taken together, suggest that, at least in the time period observed, EBT had no impact on participation in the FSP.

Exhibit 3-34

**IMPACT OF OFF-LINE EBT SYSTEM ON LEVEL AND TREND IN
PARTICIPATION OF HOUSEHOLDS IN THE FOOD STAMP PROGRAM IN
MONTGOMERY COUNTY, OHIO
(September, 1989 - January, 1993)**

	<u>Pre-Implementation</u>	<u>Post-Implementation</u>
Level of FSP participation (number of households)	19,073	18,484 ^a
Trend in FSP participation (households per month)	139.53	146.49 ^b

Notes: ^a Reflects the expected intercept based upon intervention at time = 0.

^b Change in trend not statistically significant.

Chapter 4

IMPACT OF THE OFF-LINE EBT SYSTEM ON FINANCIAL INSTITUTIONS

Financial institutions (FIs) process food stamp benefits in both the paper and EBT environments. In the paper system, retailers count the food coupons and prepare deposit documents for the total amount of food coupons they deposit. The retailers deposit the coupons with their local financial institutions for credit to their accounts. The FIs process these deposits, post credit to the retailer accounts, and send the coupons to the Federal Reserve Bank (FRB) for final processing and reimbursement of funds to the local FI. The FRB is also responsible for destroying all deposited food coupons.

In the EBT system, credits are passed to each retailer's account through the automated clearing house (ACH). The EBT processor accumulates the transactions for each retailer and calculates the net amount due to the retailer. The EBT processor submits a file of credits in ACH format to the concentrator bank. Because EBT credits to retailers are standard ACH entries, they are combined with other ACH items into one file and submitted by the concentrator bank into the ACH. The ACH processes the items from all member banks, sorts the items by the receiving bank's transit routing (ABA) number, and delivers the items to the retailers' FI. The items are received by the FI and posted to the retailer's account.

INTRODUCTION

This chapter analyzes the impacts of the off-line EBT demonstration on the retailers' FIs, the concentrator bank, and the Federal Reserve Bank (FRB) in Cleveland. Cost information, as provided by these banks, is included within each section.

The concentrator bank selected by National Processing Company (NPC) for the off-line demonstration was First National Bank of Dayton. As a subsidiary of National City Corporation,

FNB-Dayton is an affiliate of NPC. The ACH processing for FNB-Dayton is handled by Bank Ohio in Columbus, also a subsidiary of National City Corporation.¹

Data Collection Process

Information for this analysis was collected in two waves, corresponding to pre- and post-EBT system implementation. Pre-implementation interviews were conducted with officials at each of the FIs to which retailers participating in the EBT Demonstration deposited food coupons, and with representatives at the Cincinnati FRB (which processes food coupons for the demonstration area). Post-implementation interviews were conducted with the FIs that receive EBT credits for retailers, the EBT concentrator bank (which originates the credits into the ACH network), and the FRB in Cleveland (which processes ACH items originated by the concentrator bank). It can be expected that the FIs that process food coupons would be impacted by a reduction in the volume of food coupons processed at the banks; however, due to the limited scope of the demonstration, it is unlikely that staff requirements at these FIs would have changed.

The post-implementation interviews with financial institutions and FRB officials obtained information on the food stamp benefit redemption procedures, the cost associated with these procedures, and each FI's impression of the EBT system. Costs have been determined based on an average cost per \$1,000 of benefits redeemed. Information gathered during the pre-implementation phase included the labor hours required for food coupon processing. This data is compared to the data collected during the post-implementation phase to determine the impact on the FI's workload and processing activities.

ACH Processing

As noted above, the EBT system uses the ACH to credit retailers' accounts. Some background information is provided here to familiarize the reader with the basics of ACH. There are five components in ACH payments:

¹ Effective March 31, 1993, National City Corporation changed the names of its subsidiaries First National Bank of Dayton and Bank Ohio to National City Bank (NCB)-Dayton and NCB-Columbus, respectively.

- Originating Company (EBT processor)
- Originating Depository Financial Institution (ODFI, NCB-Dayton)
- ACH Network
- Receiving Depository Financial Institutions (RDFI, retailer's FI)
- Recipient (the retailer's account)

Financial institutions choose to be members of the ACH network by joining the local association. There are 40 ACH associations with processing provided by private sector processors (such as Visa) as well as the Federal Reserve Banks. In the Dayton area, ACH processing is provided by the Federal Reserve Bank in Cleveland. When a file is sent by the ODFI into the ACH network, the ODFI has certified the validity of the entries on that file. Once the items are released to the ACH network, the bank is liable for the value of the file. FIs can elect only to receive ACH items, or to receive and originate ACH items. All of the FIs involved in the post-implementation interviews provide both services; however, with the exception of NCB-Dayton, the EBT program uses only the ACH receiving service of the FIs.

In the EBT demonstration, when a retailer is established on the database, the EBT processor creates and submits ACH prenote entries to NCB-Dayton. Prenotes are zero-dollar items that are sent through the ACH system in advance of actual ("live") dollar transactions. The prenote alerts the RDFI that electronic items will be arriving and provides the bank with the opportunity to verify that the account number and account type (checking or savings) are correct. Prenotes are required for credits and debits to consumer accounts and certain types of ACH items to commercial accounts, but are *not* required for EBT credits to retailers. However, many EBT processors send prenotes to ensure that the account information received from the retailer is correct. The handling of prenote entries varies across banks. Some banks do not acknowledge prenotes because they do not represent actual funds, and these banks provide only notification of errors when a live transaction cannot be posted to the account. Other banks do not verify whether prenotes have been received prior to posting a live transaction to the account. Technically, if a live transaction is sent by a company to an account which should have been prenoted, the bank may reject the live transaction, returning it to the company. Many of the FIs interviewed during the post-implementation interviews are currently undergoing mergers,

streamlining, or are upgrading their ACH processing capabilities and expect to track the receipt of prenote entries in the future.

RETAILERS' FINANCIAL INSTITUTIONS

This section deals with the FIs used by the retailers in the pre-implementation and the post-implementation environments. The initial discussion covers the role of the FIs in coupon redemption, followed by the FIs' role in ACH processing. In coupon redemption, retailers only used local FIs due to the need to physically deliver coupons for processing; the same is not true for EBT.

The Role of Retailers' Financial Institutions in Food Coupon Redemption

The FIs interviewed during the pre-implementation phase were identified based upon food coupon redemption information supplied by the FNS Minneapolis Computer Support Center (MCSC). These FIs were identified if they received food coupons for deposit from any of the retailers participating in the Dayton EBT demonstration. Initial information, gathered in October, 1991, identified seven FIs that were involved in the receipt and processing of food coupon deposits from the retailers. Of the seven FIs, two merged and consolidated food coupon processing activities. The pre-implementation group therefore consisted of six FIs, along with the Cincinnati branch of the Federal Reserve Bank, which handles food coupons for the Dayton, Ohio area.

Food Coupon Redemption Processing

The FIs indicated in interviews that they use a similar redemption process. However, because food coupon processing represents a small fraction of their total deposits and workload, bank personnel did not have detailed cost information available for several areas, and they provided "best estimates" based upon their knowledge and experience.

Each of the FIs accepts food coupons at multiple locations, verifies the deposit, provides initial credit to the depositor, and sends the food coupons to a single location for further

processing. When food coupons are received at a branch, deposits are made over the counter at the teller window, through the night depository, or via an armored courier that delivers coupons directly to the branch. Bank officials noted that most frequently, retailers deposit food coupons at the teller window. At the teller window, responsibilities range from counting all coupons received, to counting the number of full straps and the number of loose coupons, to not counting coupons at all. Of the six FIs interviewed, three indicated that branches are required to perform a full count of coupons, one indicated that branches were required to count only the loose coupons and the number of full straps, and two indicated that branches were not required to count any coupons. Food coupons are usually counted manually; however, in some branches large food coupon deposits can be counted with a currency counting machine. In addition, several bank officials noted that tellers are required to examine food coupons to ensure that they have been cancelled by the retailer. All banks indicated that food coupon deposits must be accompanied by a Redemption Certificate (RC), and a separate deposit slip must be completed for food coupon deposits. The source of the initial credit amount provided to retailers varies based upon whether or not the FI branch counts food coupons. If the branch verifies the deposit amount, the actual count of food coupons is used; otherwise, the amount indicated by the retailer on the RC or deposit slip is used.

While the sequence of activities and the area responsible for performing specific steps in processing food coupons varies among the FIs, all branch activities are handled by tellers or head tellers. The procedures in common between FIs include: examining coupons for cancellation stamps; verifying deposit amounts; writing the bank total on the RCs; completing internal bank forms to debit a bank account and credit the retailer; keying the deposit information (amount and account number) into the teller's computer terminal; providing the customer with a receipt; and separating and storing food coupons and associated paperwork as appropriate. Food coupon deposits are delivered to the bank's central processing area for further processing.

In addition to making deposits at branches, retailers with a high volume of deposits may deliver food coupons directly to the bank's central processing location. In either event, the bank performs a series of processing activities and then deposits the food coupons with the Federal Reserve Bank. To prepare food coupons for deposit to the Federal Reserve Bank, the following steps are taken: count coupons to verify the retailer deposit amount; prepare coupons for the

Federal Reserve by strapping them in groups of 100; reconcile coupon total to RC amounts; encode the dollar amount on the RCs using MICR (magnetic ink character recognition); prepare food coupon deposit document (FCDDs); and prepare documents for shipment to the Federal Reserve. The level of detail at which deposits are verified varies significantly between banks, and is inversely related to the thoroughness of the verification performed at the branch level. Banks that perform little or no deposit verification at the branch provide full count at the central processing location; while banks that performed extensive deposit verification at the branch did less counting at the central processing location.

Food Coupon Redemption Costs

In the pre-implementation data collection effort, information was obtained from the six FIs about the costs associated with food coupon processing. These costs are not reimbursed by the Federal government, nor can the costs be directly charged to the retailer making the deposit. Costs were determined to reflect the expense associated with redeeming \$1,000 worth of food coupons.

According to MCSC redemption data for February, 1992, 18,296 RCs were submitted by the six FIs, resulting in total food coupon redemptions of \$17,760,652. Just over \$2 million (12 percent) came from retailers participating in the demonstration (as of the end of February, 1992). Exhibit 4-1 provides coupon redemption data for the FIs surveyed.

Exhibit 4-1

FINANCIAL INSTITUTION FOOD COUPON REDEMPTION DATA
(February, 1992)

<u>FI Number</u>	<u>FI Redemption Data</u>	
	<u>Number of RCs</u>	<u>Dollars</u>
1	7,405	\$9,020,544
2	4,485	3,436,216
3	1,125	2,135,787
4	2,528	1,533,544
5	1,845	1,303,123
6	908	331,438
TOTAL	18,296	\$17,760,652

This redemption data, combined with information gathered from interviews with the FIs, was used to calculate the FI costs for each \$1,000 of food coupons redeemed as presented in Exhibit 4-2. The cost components used in the pre-implementation analysis were:

- labor costs for food coupon processing operations;
- labor costs for resolving discrepancies in food coupon deposit amounts;
- non-personnel costs for food coupon processing operations;
- transportation costs; and
- float costs.

As noted above, food coupon deposits account for a small portion of the workload at the FIs, and therefore, bank personnel did not have detailed cost information for several component areas. For these areas, "best estimates" were provided by the respondents based upon their knowledge and experience.

Labor Costs to Process Food Coupons. Labor costs to process food coupons were determined based upon information provided by each FI and MCSC data indicating the number of RCs submitted to the FRB-Cincinnati each month. On average, 0.12 person-hours of branch

personnel time was required to process \$1,000 worth of food coupons. At the average loaded personnel cost of \$8.78 per hour, this equates to \$2.11 per \$1,000 in benefits redeemed.

For the six FIs combined, about 830 hours were required each month to perform the required functions. Using an average hourly personnel cost of \$9.09, FIs reported loaded personnel costs of \$7,546 for these functions. It was determined that, on average, 0.047 person-hours were required to process \$1,000 of food coupons at the central processing site. The loaded personnel rate is combined with a 100 percent indirect cost rate to yield an approximate cost of \$0.85 per \$1,000 of coupons redeemed.

Exhibit 4-2

**FINANCIAL INSTITUTION FOOD COUPON COSTS
PER \$1,000 OF BENEFITS REDEEMED**

<u>Cost Component</u>	<u>Cost per \$1,000</u>
Labor costs to process food coupons*	
Branches	\$2.11
Central Processing Site	\$0.85
Total	\$2.96
Labor costs to resolve discrepancies*	\$0.02
Non-personnel costs	\$0.05
Transportation costs	\$0.14
Float costs	\$0.33
Total FI Costs	\$3.50
Total Reimbursed	\$0.00
Net Cost	\$3.50

Note: * All labor costs use loaded wage rates and a 100 percent indirect cost factor.

Source: Financial institution baseline interview data and MCSC redemption data for February 1992.

Labor Costs to Resolve Discrepancies. Discrepancies include: differences between the retailer's deposit amount and the bank's credit to the retailer and differences between the bank's deposit amount and the FRB's credit to the bank's account. FI representatives indicated that there are very few discrepancies to resolve, especially for FI/FRB differences; the number of problems to be resolved averaged just under one per FI per month. On average, FIs reported about 26.5 instances per month where bank personnel needed to reconcile retailer deposit amounts to FI

credits. These discrepancies were resolved at either the central processing location or at FI branches. FI representatives provided estimates of the amount of time required to resolve the problems. Costs were determined by multiplying the time required, the loaded wage rate for the relevant personnel category, and the assumed indirect cost rate of 100 percent. The labor costs for resolving discrepancies was small (\$0.02 per \$1,000 in coupons redeemed), as would be expected based upon the limited scope of the problem.

Non-Personnel Costs for Food Coupon Processing Operations. These costs included costs for equipment and supplies. Each of the FIs interviewed uses some type of counter (to count food coupons at the central processing site) and a MICR encoder or proof machine (to encode the amount on the RC). Equipment costs were allocated based upon the percentage of time that the FI representatives indicated that the equipment was used for that purpose. Other equipment and supply costs included: terminals interfaced with coupon counters; straps for bundling food coupons; bank forms used in the process (such as debit/credit forms); calculators for balancing and reconciling differences; and seals for canceling food coupons. The equipment and supply costs totaled approximately \$0.05 per \$1,000 of benefits redeemed.

Transportation Costs. All six FIs indicated that they send food coupons to the FRB with their regular Federal Reserve shipments. Because these shipments contain currency and coins, the items are sent using an armored courier at a fixed cost per delivery. The average delivery cost reported by the FIs was approximately \$36 per trip. Based upon volume, food coupon delivery accounted for between 0.05 percent and 0.50 percent of the total Federal Reserve delivery costs. Included in the transportation costs is the cost of shipping coupons from the branch locations to the central processing site. Overall, transportation costs contributed an estimated \$0.14 per \$1,000 in benefits redeemed to the FI's processing costs.

Float Costs. All six FIs credit the retailer's account on the same day that the retailer deposits food coupons, or on the next day. However, the FIs do not receive credit from the FRB for one or more days after that. As a result, the FI incurs an opportunity, or float, cost that is equal to the alternative use of the money during that period. The float cost per \$1,000 in benefits redeemed was calculated using the daily interest rate (annual rate divided by 360 days) multiplied by the number of days of float (calculated to be 2.86 days), multiplied by \$1,000. Based upon

the opportunity cost cited by the FIs (Federal Funds rate of 4.06 percent in February, 1992), the weighted average float cost for the six FIs was calculated to be \$0.33 per \$1,000 in benefits redeemed.

The Role of Retailers' Financial Institutions in EBT Redemption

The EBT processor maintains a database of retailers that includes the transit routing number of each retailer's FI as well as the retailer's account number at the FI. The retailer's FI must be a member of the ACH network, and therefore be able to receive and post ACH items. The EBT processor creates a file of credits in ACH format and submits the file to the concentrator bank. The EBT credits are processed, the effective settlement date of the credits is verified, and an ACH file is submitted by the concentrator bank into the ACH network, where the items are sorted and delivered to the retailer's FI. The retailer's FI receives the ACH file and posts credit to the retailer's account on the effective settlement date. In the Dayton demonstration, the credit is received and posted to the retailer's account one bank business day after the EBT processor's cycle cutoff time of 4:00 a.m.

Based upon data collected in November, 1992, 13 FIs were identified as receivers of EBT items. The FIs were identified by reviewing the transit routing numbers on the retailer database file at the EBT processor. Several of these banks have consolidated ACH processing at one location for all banks within the holding company. As a result, 10 FIs receive ACH credits. Of these banks, one did not participate in the data collection process and another was able to provide only partial information.

All items processed through the ACH contain information on the sender of the item, the FI transit and routing (ABA) number, the account to which the item should be posted, and the date on which the item should be posted (the effective settlement date). When ACH items are received at the FI, the debits and credits are directed to either the checking account or savings account system, depending upon the information contained on the ACH record.

EBT Redemption Processing

Personnel within the ACH Operations site for each of the FIs were interviewed to determine the impact of the EBT system on their operations. While food coupons must be physically delivered to a local bank for processing and posting, the EBT system's only restriction on the retailer's bank selection is that the bank be able to accept and post ACH items. This allows a retailer to concentrate funds directly, rather than posting them at a local bank and subsequently transferring the funds to another account. This feature is particularly attractive to retailers who want to consolidate the deposits of several stores to one bank account, while at the same time retaining the identity of each store's deposit amount. A review of the banks used by food retailers to accept EBT credits indicates that many retailers used non-local banks. The FIs used by retailers in the Dayton Off-line demonstration range in location within Ohio from Dayton to Cincinnati and Columbus, to one financial institution in Minnesota. All FIs interviewed were unaware that they were receiving EBT credits to retailers' accounts. Because these items are not distinguishable from other ACH credits, statistics were gathered on the volume of ACH credits received in the month of December, 1992 (for consistency across all banks). Data is presented in Exhibit 4-3.

Using data provided by the EBT processor for December, 1992, 2,482 EBT items were processed by the concentrator bank; 1,746 were sent through the ACH to other FIs (transit items). Based upon data provided by these FIs, over 1,730,900 ACH credits were received, indicating that less than one tenth of a percent (0.0010) of all ACH credits received by the FIs during December, 1992 were EBT-related.

All of the FIs interviewed receive files from the FRB via data transmission. Of the eight FIs that receive ACH files containing EBT-related items (the concentrator bank's items are not sent through the ACH), five received two files daily from the FRB, and three received one daily file. When a single file is received, it usually arrives between 2:00 a.m. and 8:30 a.m. (local time). Two of the banks reported receiving files from the FRB into a PC, using a service of the FRB known as Fedline. These files are subsequently uploaded to the FI's mainframe computer for processing. Transmittal totals (indicating the number of items and dollar value of the file)

Exhibit 4-3

**AUTHORIZED FOOD RETAILERS'
FINANCIAL INSTITUTIONS
ACH CREDITS RECEIVED, DECEMBER, 1992**

<u>FI Number</u>	<u>ACH Credits Received</u>	<u>ACH Dollars</u>
1	127,525	\$334,875,653
2	419,400 ^a	N/A
3	204,000	\$463,000,000
4	1,267	N/A
5	38,700	N/A
6	38,937	\$203,535,388
7	230,300 ^a	N/A
8	736 ^b	\$567,750
9	670,800 ^a	N/A
TOTAL	1,731,953	N/A

Notes: ^a Monthly volume estimated based upon annual credits processed.

^b EBT only.

N/A = Not Applicable

are always provided by the FRB. The FIs report that on very rare occasions files are not received in a timely manner from the FRB or the transmission line fails. In these instances, the corrected files have always been received from the FRB in time to make the processing windows for each FI's posting systems, resulting in no customer impact. The contingency plans of the FRB include transmitting the files to a regional/local FRB office where a magnetic tape would be created and delivered by courier to the bank. The FIs that were interviewed have not experienced any problems with data on the files from the FRB.

All of the FIs interviewed report that they have automated programs that take files received from the FRB and run several pre-edit routines before processing the files. All ACH files are pre-processed to sort items into checking and savings systems. Items rejected for invalid account number (using bank account check-digit routines) are usually researched when rejected, and posted on the effective settlement date. The exception to this is when a retailer's account

cannot be located, in which case the items are returned through the ACH to NCB for resolution. The FIs reported that every attempt is made to post credit transactions at the FI. Four of the eight FIs memo-post items to their posting systems. Memo-posting is a process whereby entries destined for posting on the effective date (actual posting to accounts at FIs is performed late in the evening on the effective date) are made available to customers prior to actual posting at close of business. Two of these FIs indicated that they memo-post items received on the afternoon ACH file from the FRB. The other two of these FIs indicated that items received on the morning ACH files from the FRB are memo-posted to the account system by the opening of business. Information concerning these items is generally made available to customers through information reporting services, terminals at teller stations, and ATMs. Items received by FIs on the afternoon files which are scheduled for posting that day will be posted to the account, and will not be affected by memo-posting. According to the Operating Guidelines of the ACH, the receiving FI is required to make funds available to cover cash withdrawals on the effective settlement date.

The retailer is able to match the value of the EBT transactions at its selected cutoff time (at or prior to 4:00 a.m.) with the amount posting to its account through various methods. All FIs surveyed indicated that retailers receive notice of items posting to their accounts via their bank statement. Statements are usually produced monthly, although at least one bank allows the customer to determine the frequency of statement cutoff through the customers' use of the FI's Account Reconciliation service. One FI stated that if the account was a savings account, statements were provided on a quarterly basis. Two FIs offer account information only on account statements; however, seven of the FIs (including NCB) offer balance reporting services, typically accessed by a PC, that show account activity on a same-day or previous-day basis. The FIs stated that the customer would need to be set up for the service in order to receive account information in this manner.

EBT Redemption Costs

Cost calculations within this section pertain to the costs of processing the retailer credits at all retailers' FIs excluding the concentrator bank. These items are sent through the ACH and are commonly referred to as "transit items." The costs of processing the retailer credits at the concentrator bank is included within the concentrator bank section. Interviews with FIs indicated

that the time spent on processing files received through the ACH ranged from 15 minutes to 30 minutes per day, involving Management Information Systems (MIS), Bookkeeping, and ACH Operations staff. The majority of the processing is automated and requires no intervention. The time averages and fully loaded salaries (including a 100 percent indirect cost rate) were used for calculations within this section. Information provided by the EBT processor indicates that a total of 2,482 retailer credits were processed in December, 1992 (1,746 transit, 736 NCB) representing \$2,135,074.32 (\$1,567,324.01 transit, \$567,750.31 NCB). Because EBT transactions comprise a portion of the entire ACH file, costs pertaining to the entire file were allocated based upon December, 1992 statistics presented in Exhibit 4-3 (0.10 percent of the cost is estimated to be attributable to EBT). Costs are assigned directly to EBT items where possible. Exhibit 4-4 provides the breakdown of EBT redemption costs.

Labor Costs for EBT Processing. EBT processing costs were determined based on information provided by each FI. On average, 0.04 person-hours of personnel time was required to process \$1,000 of EBT credits. Using the average loaded personnel cost, and the determination that 0.10 percent of the files are EBT-related, this equates to \$0.0007 per \$1,000 in benefits redeemed. During December, 1992, 44 exception items were processed. The FIs interviewed indicated that this task was performed by a higher level of staff. Based upon the average loaded personnel cost provided by the FIs, and an estimated time of one minute per exception item, during the month of December, 1992, the cost per \$1,000 of EBT benefits processed equates to \$0.0134.

ACH Charges. FIs reported that the charge to receive ACH items is \$0.01 for intra-regional items and \$0.015 for inter-regional items. In addition, a per file charge of \$1.50 is assessed. Due to the timing on processing EBT items, the items would be included on the morning files to the FI. With 22 business days in the month, a maximum of 176 files per month could include EBT items for the eight FIs. Based upon the monthly charge incurred, and the dollar value of EBT credits processed through the ACH during the month, the cost per \$1,000 of benefits redeemed is \$0.0002. Based upon information provided by the EBT processor, it was determined that 55 of the 1,746 transit items processed were inter-regional. The cost to FIs to receive EBT items during December, 1992, therefore, was \$0.0114 per \$1,000 of benefits.

Exhibit 4-4

**FINANCIAL INSTITUTION
EBT REDEMPTION COSTS AND REIMBURSEMENTS
PER \$1,000 OF BENEFITS REDEEMED**

<u>Cost Component</u>	<u>Cost per \$1,000</u>
Labor^a	
Receive and process ACH file	\$ 0.0007
Process EBT exceptions	\$ 0.0134
ACH Charges	
File receipt	\$ 0.0002
EBT items	\$ 0.0114
Float^b	\$ 0.0000
Total FI Costs	\$ 0.03
Total Reimbursed	\$ 0.12
Net Cost	(\$ 0.09)

Notes: ^a All labor costs use loaded wage rates and a 100 percent indirect cost factor.

^b All float is eliminated in the EBT system.

Source: Financial institution and EBT processor interview data.

Reimbursements. Two of the FIs reported that customers were charged for deposits (including EBT credits) to their accounts. The reported charges range from \$0.25 - \$0.27 per credit posted. Based upon data from December, 1992, charges from these FIs for posting credits to the retailers' accounts totalled \$178.68, or \$0.12 per \$1,000 redeemed from all FIs.

The Impact of EBT on Retailers' Financial Institution Costs

EBT items are handled predominantly within the ACH Operations area of each FI, and none of the officials interviewed at the FIs were aware that they were receiving EBT credits. ACH Operations does not interface with the paper processing side of the FIs, and therefore the FI personnel interviewed were not aware of any impact of the EBT system to their food coupon processing volumes. Of the six FIs interviewed during pre-implementation data collection, only three directly processed the ACH EBT credits in the post-implementation data collection. One of these banks was not able to respond to our interviews due to consolidation projects.¹ ACH processing for the remaining three institutions had been consolidated to locations outside of Dayton.

When the bank officials were asked for their opinions of EBT, all noted the increased efficiency of electronic payments over paper items and the minimal impact to ACH operations in receiving ACH credits. (The returns and rejects were the only areas where increased time would be needed with increased volume.) An increase in the volume of EBT transactions would not have an impact on the bank's ACH operation because a single credit to each retailer is created by the EBT processor for all transactions during the day. While the conversion of a retailer from food coupons to EBT could reduce or shift the staffing requirements within the branch or central processing area for coupons, it would not impact the ACH operations area.

Due to the fact that EBT credits are standard ACH payments, the FIs did not anticipate any errors with the items received through the ACH. Suggestions for improvement in the EBT items were addressed generically to ACH items; for example, some noted the need to use clear descriptions on items to identify who sent the funds.

CONCENTRATOR BANK

National City Bank (NCB) uses various edit routines during processing of the ACH files received from the EBT processor and other companies. The ACH system at NCB rejects any

¹ Consolidation projects relate to specific tasks involved when bank operations areas are blended following mergers.

ACH items destined for NCB accounts with account numbers that do not match the format for NCB. These items are researched to determine the correct account number. If the account is identified, the credit is posted on the settlement date, and a correction notice is sent to the EBT processor. Once items are sent into the ACH, they can be returned by the retailers' FI for a variety of reasons. For example, when ACH credits are rejected from the account posting system, a bank usually researches the item to locate the correct account number, posts the credit to the account, and generates a notification of change back through the ACH to NCB-Dayton. NCB-Dayton then notifies NPC to correct the retailer's account number on the NPC database. If the bank cannot locate the retailer's account, the funds are returned through the ACH to NCB.

The Role of the Concentrator Bank in Food Coupon Redemption

A concentrator bank is not used in food coupon processing. The concentrator bank initiates the credit to retailer accounts through the ACH.

The Role of the Concentrator Bank in EBT Redemption

The EBT process in Dayton is streamlined to consolidate transaction information at the EBT processor. The EBT processor (NPC) calculates the total amount due to the retailer, creates a file of retailer credits in ACH format, and transmits the file to NCB-Columbus, where ACH processing is performed. Items included in the file have an effective settlement date (at the retailer's FI) of the next banking business day. To retain the integrity of the retailers' daily EBT totals, the files sent on Monday representing weekend transactions include one credit for each retailer day. The total amount of retailer credits on each ACH file is offset with a single debit to an account at NCB. When the EBT system was designed, NCB established an account at NCB-Dayton for settlement. This account enabled the bank to measure and track settlement more closely. The bank worked extensively with NPC to clarify ACH formats and test files created by NPC. In addition, the bank made minor changes to its information reporting service.

EBT Redemption Processing

NCB-Columbus sends (originates) the retailer credits into the ACH network on behalf of NCB-Dayton. The bank sends these credits to the ACH one day prior to the posting date of the credit at the retailer's FI. On the morning of the posting date, NCB-Dayton's Federal Reserve bank account is debited for the value of the ACH credits sent with that posting date.

When files are received for processing at NCB, the total debits and credits on the EBT file are calculated and compared with the totals provided by NPC to verify that the correct file was received. NCB-Columbus processes ACH files on behalf of several banks within the NCB holding company, taking all ACH files received during the day on behalf of NCB-Dayton, processing the files, and releasing the EBT-related items with other ACH items to the ACH network in the evening. Ultimately, it is the goal of the concentrator bank to receive federal reimbursement at the same time that the debit is posted to its account. The request for federal reimbursement is made by NPC using the Department of Health and Human Services' (DHHS) SmartLink/Payment Management System (PMS) service. The request for reimbursement to the NCB-Dayton account is made during the day, while NCB is processing the EBT file, and the PMS reimbursement request is released to the ACH network for processing in the same cycle with the retailer credits. Therefore, for the Dayton off-line demonstration, reimbursement funds (representing all EBT credits on the file from the EBT processor) are received by NCB coincident with the debit to NCB-Dayton's account at the Federal Reserve Bank in Cleveland. The reimbursement credit represents the value of the EBT credits released to the ACH plus the credits to the retailers with accounts at NCB. Funds to retailers with accounts at NCB are made available to these retailers at the same time that the reimbursement is received.

All FIs receiving credits to retailer accounts for EBT transactions receive their ACH file from the FRB in the morning. Because banks update their posting systems (checking and savings) late at night on the settlement date, the ACH items do not show as available funds at the retailer's FI (except NCB accounts). Some FIs indicated that their *information reporting* service offers an independent "intra day" feature that provides information similar to that which would be provided by a memo-posting system.

EBT Redemption Costs

According to NCB-Columbus officials, processing the EBT file from NPC requires 15 minutes each day. Items that are rejected from the ACH processing at NCB-Columbus, or that are returned to NCB-Dayton (through Columbus) from the ACH, are handled as exceptions within the bank's processing area. It is estimated that the time spent on resolving these issues averages five minutes per day. On a monthly basis, an additional five minutes of staff time is expended on fee-analysis tasks (for customer billing purposes) related to the EBT file from NPC. On a monthly basis, the total time spent at the concentrator bank for handling EBT files and items is 7.4167 hours.

Using a fully loaded salary (based upon hourly rates provided by NCB-Dayton), the resulting total monthly operating cost was \$142.70, or \$0.067 per \$1,000 of benefits redeemed. Officials at NCB-Columbus stated that the time to originate a file of 3,000 items or a file of 30,000 items would be the same (the file size would be larger, but the time is not dependent on the size). Because NCB sends credits to retailers, the time expended is not affected by the number of food stamp recipients on the EBT program. It is expected, however, that increases in the number of *retailers* on the system will increase the number of exception items (rejects or returns). An increase in the dollar amount of redemptions, without an increase in the number of retailers, would result in a reduction in the cost per \$1,000 of benefits redeemed. An increase in the number of recipients will lead to an increase in the value of funds redeemed, and a decrease in the cost per \$1,000 redeemed.

NCB is charged by the ACH Operator (the Federal Reserve Bank in Cleveland) for sending items into the ACH. Each retailer credit is charged \$0.01 for intra-regional and \$0.015 for inter-regional, plus a night-cycle surcharge of \$0.01. Items delivered by NPC are processed at NCB-Columbus during the day and released to the ACH Operator in the evening for credit the following business day. Because these items are processed through the ACH night cycle, the night-cycle surcharge is assessed. This yields a cost of \$0.023 per \$1,000 of benefits redeemed. Items destined for any of the NCB banks are not processed through the ACH, and therefore do not incur these per-item fees.

NCB charges the EBT processor for processing EBT retailer credits through internal service pricing to NPC. The charges to NPC for December, 1992 processing were \$486.75, representing 31 files (one file is created for each day, although the weekend and holiday files are delivered for processing on the next banking business day), 2,482 transactions (including 1,776 transit items), and 44 exception items. The numbers differ slightly from those provided by the EBT processor due to timing differences in capturing the data.

Based upon the value of EBT transactions that NPC reported during December, 1992 (\$2,135,074.32), the concentrator bank was reimbursed \$0.23 per \$1,000 of benefits redeemed. The concentrator bank costs are displayed in Exhibit 4-5.

Exhibit 4-5

**CONCENTRATOR BANK EBT REDEMPTION COSTS
PER \$1,000 OF BENEFITS REDEEMED**

<u>Cost Component</u>	<u>Cost per \$1,000</u>
Labor Costs	\$0.067
ACH charges for EBT items originated	\$0.023
Float	\$0.000
Total Concentrator Bank Costs	\$0.09
Total Reimbursed	\$0.23
Net Cost	(\$0.14)

Source: Concentrator bank interview data and NPC monthly reports.

The Impact of EBT on Concentrator Bank Costs

The officials interviewed at the concentrator bank have a very positive opinion of the EBT system, noting that the reduction in food coupons processed in the vault area will provide

significant savings to the banks. Bank officials noted that for food coupon processing at NCB, 1-1/2 full time employees are dedicated to the process, handling counterfeit detection, mangled forms, etc. The EBT file processing is handled by the ACH area without additional staff. The labor savings to the bank by converting paper transactions to electronic can be staggering. Officials at the bank indicated that, in general, when an electronic alternative is available, an increase in fees for processing paper would encourage customers to switch to the electronic alternative. In addition, the officials noted that the EBT system is viewed as being more secure than paper, and provides accurate reporting, even on an intra-day basis. The security and reporting features are very important to the higher dollar volume customers.

As noted above, the concentrator bank anticipates that increases in the number of retailers on the system could affect the number of exception items (returns, rejections, and corrections) to be processed. ACH rejections occur at several points within the processing of items, most often in the pre-edit routines at NCB, or in the checking and savings account posting systems at NCB or other FIs:

- Items can be rejected by the pre-edit routines if the ABA number does not pass the check-digit edit routine. (ABA numbers are nine digits in length; the ninth digit is a check digit.) Items can also be rejected if the account number for an NCB item does not match the account number format of NCB accounts.
- Rejections occur from the checking and savings account systems at the retailers' FI (NCB or other banks) if the account number is closed or incorrect. Most FIs attempt to post rejected credits to the retailers' account, sending a notification of change (NOC) through the ACH to NCB so that the account number can be changed on NPC's retailer data file. While these problems do not occur frequently, they are a standard part of ACH processing, and retailers must notify the EBT processor when they are changing banks or account numbers.

THE FEDERAL RESERVE BANK

The Cincinnati Branch of the Cleveland Federal Reserve District processes food coupons for the entire Federal Reserve district, including food coupons deposited to the Cleveland or Pittsburgh FRBs. The Cleveland FRB performs ACH processing.

The Role of the Federal Reserve Bank in Food Coupon Redemption

Cincinnati FRB officials were interviewed to determine the costs involved in processing food coupons. The costs provided within this section are based on the weighted averages of actual costs billed to FNS for the period September, 1991 through February, 1992 for food coupon processing at the Cincinnati FRB, as well as average redemptions through the Cincinnati FRB over the same period.

Average monthly redemptions for the period were \$139,274,392. Including only the FIs that deposit directly to the Cincinnati FRB, over 10 million food coupons with a value of over \$53 million (1991) are received and processed by the FRB monthly. During February, 1992, the Cincinnati FRB processed total food coupon deposits of \$137,203,289 for the entire FRB District. Of this amount, \$56,266,136 came from FIs that deposit coupons directly to the Cincinnati FRB branch.

Food Coupon Redemption Processing

Federal Reserve responsibilities for food coupon processing include three basic functions: food coupon processing; reconciliation; and debit/credit to the FI. The processes are discussed below.

- Food Coupon Processing - Includes receiving and opening packages containing food coupons, balancing food coupons to food coupon deposit documents (FCDDs) prepared by the FI and submitted with the deposit, sampling coupons to determine the correct count, inspecting coupons to determine authenticity, and destroying coupons.
- Reconciliation - Includes preparing redemption certificates (RCs) for high speed processing, balancing FCDD amounts to RC amounts, reconciling out-of-balance deposits, preparing deviation reports, transmitting redemption data to the Minneapolis Computer Support Center (MCSC), reviewing microfilm and sending to MCSC, and storing and discarding RCs.
- Debit/Credit - Includes key-entering FCDD data to the computer terminals to credit the accounts of FIs, preparing debit vouchers (SF-5515s) to charge FNS to offset the FI deposit credits, and preparing document destruction forms (FNS-311s).

Food Coupon Redemption Costs

Exhibit 4-6 provides the costs incurred in coupon redemption at the Cincinnati branch of the FRB.

Exhibit 4-6

FEDERAL RESERVE FOOD COUPON COSTS PER \$1,000 OF BENEFITS REDEEMED^a

<u>Cost Component</u>	<u>Cost per \$1,000</u>
Labor costs	\$0.30
Non-personnel direct costs	0.09
Indirect costs	0.09
Overhead costs	0.26
Total Cost	\$0.74
Total Reimbursed	\$0.74
Net Cost	\$0.00

Note: ^a The redemption amount used in calculating the cost per \$1,000 in benefits redeemed is \$139,274,392. This is the average of the monthly food coupon deposit document (FCDD) redemption amounts for the six-month period (September, 1991 to February, 1992) for the entire Cleveland FRB district provided by the Minneapolis Computer Support Center (MCSC).

Source: Federal Reserve Bank interview and Federal Reserve invoices submitted to FNS for the months September, 1991 through February, 1992.

The average monthly Federal Reserve personnel cost for food coupon processing during the pre-implementation period was \$42,078, which translates to \$0.30 per \$1,000 of benefits redeemed. Included within labor costs are the three basic functions outlined above. The FRB

interview included a discussion of the frequency and level of effort required to resolve discrepancies in food coupon deposit amounts. Consistent with the information reported by the FIs, Cincinnati FRB officials indicated that there were only a small number of discrepancies between food coupon deposits from member banks and the credits to the bank's account (nine per month on average over the period November, 1991 through January, 1992). Because resolution required only an estimated 10.83 hours per month, Federal Reserve officials estimated that labor costs, for food coupon tellers and the supervisor who resolve such discrepancies, also were small.

Non-personnel direct costs averaged \$13,212 during the pre-implementation period. The costs directly attributable to food coupon processing at the FRB include: supplies, equipment maintenance, depreciation, software, travel, communications, postage, armored courier service, and coupon residue removal. Based upon average monthly redemptions of \$139,274,392, the cost per \$1,000 of benefits redeemed was \$0.09.

The indirect cost component is based upon an allocation of FRB costs for data communications, data processing, systems support, building operations, housekeeping, printing, District projects, and other miscellaneous charges. The average monthly allocation was \$11,953, or approximately \$0.09 per \$1,000 of benefits redeemed.

The FRB also allocates a percentage of total costs to each operational area, including food coupon processing. This overhead amount reflects the food coupon portion of Federal Reserve administrative costs not charged directly to operations. Average monthly overhead costs during the pre-implementation period were \$35,712, representing \$0.26 per \$1,000 of food stamp benefits redeemed.

Because the Federal Reserve Bank bases its pricing on actual costs, the total cost incurred by the FRB in redeeming food coupons is charged to FNS. Therefore, it is expected that the FRB is reimbursed \$0.74 per \$1,000 of benefits redeemed.

The Role of the Federal Reserve Bank in EBT Redemption

NCB-Columbus transmits ACH files to the FRB in Cleveland for processing. Included on the evening file are credits to retailers for EBT transactions in the Dayton demonstration area. The FRB-Cleveland processes between 60,000 and 2.5 million ACH items per day, with the higher volume occurring when Social Security payments are processed. A small fraction of the total volume processed at the FRB-Cleveland pertains to the EBT program, with EBT transactions averaging under 2,000 items per *month*.

EBT Redemption Process

The FRB-Cleveland receives ACH-formatted files from member financial institutions in accordance with cycle delivery deadlines. The Federal Reserve currently has two cycles for ACH processing; day cycle and night cycle. EBT transactions are included in the night cycle file submitted by NCB. At the close of the delivery window for the night cycle, the FRB calculates the value of all debits and credits on each file, verifying the calculated amount with totals submitted by the bank. The ACH files are combined with other ACH files received from member FIs, and the items are sorted (by the destination ABA number) to either another ACH processor (for interregional items), or to the appropriate ACH member bank (for intra-regional items). Intra-regional items are delivered to the FI with the next scheduled ACH file delivery for that bank. According to officials at the FRB-Cleveland, all member banks receive morning ACH files; several banks also receive afternoon files of ACH items. As of March, 1993, the FRB-Cleveland reported that 94 percent of the FIs receive transmissions from the FRB-Cleveland; six percent of FIs receive ACH information on paper listings, diskette, or magnetic tape. FRB officials expect the total percentage of transmissions to approach 100 percent by July, 1993, the Federal Reserve's goal for an all-electronic ACH for non-government originated files. Debits and credits are posted to the receiving FI's FRB account, representing credits and debits originated for settlement on that date.

EBT Redemption Costs

The Federal Reserve Bank uses a nationwide policy of pricing based upon actual costs. The pricing is currently separated into credit and debit items, based upon intra-region or inter-region.¹ Each ACH member bank is assessed charges for items submitted for processing, as well as for all items received. Charges from the Federal Reserve Bank in Cleveland are shown in Exhibit 4-7 below.

Exhibit 4-7

FEDERAL RESERVE BANK - CLEVELAND ACH PROCESSING CHARGES

<u>Component</u>		<u>Price</u>
Per File		\$ 1.500
Flat Monthly Fee		10.000
Per credit	: intra regional	0.010
	: inter regional	0.015
Per debit	: intra regional	0.010
	: inter regional	0.015
Night cycle surcharge		0.010

Because the Federal Reserve Bank uses a cost-based pricing policy for ACH processing, the EBT system has no impact on FRB costs. All costs assessed to FIs are covered in the sections where those costs are appropriate; receiving ACH costs are included in the retailers' financial institution section, and originating ACH costs are included in the concentrator bank section. The FRB handles only EBT transactions sent through the ACH (i.e., items destined for

¹ FRB-Cleveland officials indicated that the pricing is expected to change to a blended charge.

NCB accounts do not flow through the FRB). Based upon information presented in previous sections, 1,746 EBT items were sent by NCB into the ACH in December, 1992.

The EBT processing costs at the Federal Reserve Bank of Cleveland are summarized in Exhibit 3-8.

The Impact of EBT on Federal Reserve Bank Costs

Officials at the FRB-Cleveland felt that there was a major benefit in using electronic processes instead of paper for the delivery of benefits: no "lost in transit" items. In addition, it was noted that staffing requirements for processing paper items included the use of 1/2 floor of staff, versus 1-1/2 people for processing electronic items. It is less expensive and more efficient to use electronic services.

From the perspective of FRB-Cleveland, there were no drawbacks to using the ACH. It was noted, however, that there might be up-front costs to others to be able to handle and process electronic items, with training, card costs, and terminals being the primary cost components mentioned. With the movement to an all-electronic vehicle by July, 1993 (and mid-1994 for Treasury), additional efficiencies can be realized. The most notable improvement is the elimination of magnetic tapes and the associated costs and delays of courier delivery and the possibility of a lost tape. These result in an increase in the number of processing cycles at the FRBs and later file delivery deadlines from the FIs. Private-sector ACH Operators are currently operating in an all-electronic environment. Later delivery deadlines will enable files delivered at the FRB after midnight to be processed and delivered to the receiving FIs that morning.

Exhibit 4-8

**FEDERAL RESERVE EBT REDEMPTION COSTS
PER \$1,000 OF BENEFITS REDEEMED**

<u>Cost Component</u>	<u>Cost per \$1,000</u>
Operating Costs	\$0.03
Float Costs	\$0.00
Total Costs	\$0.03
Total Reimbursed	\$0.03
Net Cost	\$0.00

Source: Federal Reserve Bank - Cleveland interview.

CONCLUSIONS

The off-line EBT system provides a significant reduction in cost to financial institutions when compared to food coupon processing, as shown in Exhibit 4-9. The most significant reduction is realized by the retailers' financial institutions, where the manual processing of food coupon deposits is replaced by electronic credits. In effect, the EBT processor replaces the manual processes at the retailer's back office (where food coupons are initially processed), and at the financial institution (where retailer deposits are verified). The EBT processor provides processing efficiencies by converting labor-intensive manual procedures to automated operations. The most significant reduction is realized by the retailers' financial institution (where retailer deposits are verified). The EBT processor provides processing efficiencies by converting labor-intensive manual procedures to automated operations.

Exhibit 4-9

**SUMMARY OF EBT AND FOOD COUPON PROCESSING COSTS
PER \$1,000 OF BENEFITS REDEEMED**

	<u>Off-line EBT</u>	<u>Food Coupon</u>	<u>Increase (Decrease)</u>
Retailers' FI	\$0.03	\$3.50	(\$3.47)
Concentrator Bank	\$0.09	\$0.00	\$0.09
Federal Reserve Bank	\$0.03	\$0.74	(\$0.71)
TOTAL	\$0.15	\$4.24	(\$4.09)

The Impact on Retailers' Financial Institutions

This analysis indicates that EBT systems represent significant savings to the retailers' financial institutions. In on-line and off-line EBT systems, the concentrator bank, retailers' financial institutions, and the Federal Reserve Bank handle ACH items; to the banks, the type of EBT system is transparent. In the off-line demonstration area, the food coupon processing charges per \$1,000 of benefits redeemed were \$3.50. Banks may only charge retailers for food coupon deposits that are not "Fed ready" (i.e., cancelled and strapped in batches of 100 coupons per strap per denomination). Since retailers tend to provide food coupon deposits "Fed ready", the bank's expenses associated with processing food coupons are either absorbed by the bank or paid indirectly through higher charges for other banking services. The cost of providing EBT services is significantly lower at the retailers' financial institutions, reflecting the saving of automated processing. As shown in Exhibit 4-10, the difference between food coupon and EBT redemption costs net of reimbursements indicates a net difference in costs for FIs of \$3.59 per \$1,000 of benefits redeemed.

Exhibit 4-10

**SUMMARY OF NET COSTS* FOR COUPON
AND EBT REDEMPTION
PER \$1,000 OF BENEFITS REDEEMED**

	<u>Montgomery County</u>		<u>New Mexico</u>	<u>Ramsey County</u>
	<u>Food Coupon</u>	<u>Off-line EBT</u>	<u>Change</u>	<u>EBT</u>
Retailers' FI	\$3.50	(\$0.09)	\$3.59	\$0.12
Concentrator Bank	N/A	(\$0.14)	\$0.14	(\$0.02)
FRB	\$0.00	\$0.00	\$0.00	\$0.00
TOTAL	\$3.50	(\$0.23)	\$3.73	\$0.10
				(\$0.11)

Note: * Net of reimbursements received.
N/A = Not Applicable

Revenue Impact to the Concentrator Bank

The concentrator bank function is found only in the EBT system; therefore, there are no costs for concentrator bank processing in the food coupon process. As noted previously, the concentrator bank incurs costs to process EBT items of \$0.09 per \$1,000 of benefits redeemed. The net cost to the concentrator bank of processing these credits is negative, indicating that the price the bank charges for this service more than covers the costs it incurs. The concentrator bank indicated that processing a file with 300,000 items does not cost 100 times the cost of processing a file with 3,000 items, due to fixed costs per file. In general, banks that originate ACH files into the ACH network offer tiered pricing structures that offer discounted prices for high monthly volumes of transactions.

Consistency of Results

The results of the impact of EBT on financial institutions in the off-line demonstration are consistent with studies of on-line demonstrations in Ramsey County and New Mexico.¹ Under EBT, the negative net cost in the off-line demonstration results from the processing charges of the concentrator bank, and two (out of eight) of the retailers' banks assessing deposit charges of between \$0.25 to \$0.27 per deposit. The average dollar amount of the deposits to these two financial institutions was under \$1,000, therefore on average, the reimbursement per \$1,000 of benefits redeemed across all FIs was \$0.12. In the Ramsey County and New Mexico sites, the reimbursement amount was significantly lower than in Montgomery County, resulting in higher net costs in both of these locations when compared to Montgomery County. Data from the off-line demonstration indicates that the EBT program results in net revenue for the retailers' financial institutions and the concentrator bank for each \$1,000 of benefits redeemed.

Financial institution officials interviewed for this evaluation acknowledged that they have a very favorable impression of the delivery of food stamp benefits using EBT. The EBT process uses an existing payment network (ACH) with standard formats, providing efficiencies to all participants in the system. Removing manual, labor-intensive processes enables staff resources at the financial institutions to be redirected to other functions. Because EBT uses a proven, effective, network that is compatible with a significant number of financial institutions, retailers have increased flexibility in their bank selection process.

¹ John A. Kirlin et al., The Impacts of the State-Initiated EBT Demonstrations on the Food Stamp Program, Cambridge, Massachusetts: Abt Associates Inc., June, 1993.

Appendix A

Retailers Participating in the Pre- and Post-Implementation Cost Calculations

Appendix A

RETAILERS PARTICIPATING IN THE PRE- AND POST-IMPLEMENTATION COST CALCULATIONS

Convenience Stores: (CS)

Brooks Carryout
Circle K Store 02794
Dairy Mart #7105
Dairy Mart #7107
Dairy Mart #7108
Dairy Mart #7109
Franks Fast Foods
G & G Carryout
H & K Mini Mart
In and Out Store #2
Kemos Confectionary
Killy's Mini Market
Noble's Carryout
Quick Mart
Riverside Market
S&W Mini Mart
United Dairy Farmers 211
United Dairy Farmers 212
United Dairy Farmers 220
United Diary Farmers 223
Woods Delicatessen

Grocery Stores: (GS)

A & B Stoprite Inc
Antietam Avenue Supermart
Bargain Meat Market
Bud's Neal Avenue Market
D & H Hoover MKT
Danner Avenue Supermarket
Food City Supermarket
Gold Star Market
H & L IGA
Help Center Store
In and Out Food Store #1
Jackie's Market
Nathan's Superette
Oxford Ford Mart
Saint's Carryout
Schear's Marketplace

Other Stores: (OT)

Blanks & Sons Trading Post
Dayton Fish Co
Dayton Nutra Foods
Dubro & Son Inc
Edgemont Market Place
Gebhardt's Superette Inc
L & B Distributing
Nancy's Fruit Market
Rahe's Foods Inc
Tasty Bird
Tasty Bird of Dayton Inc
Zach's Seafood

Supermarkets: (SM)

Aldi Inc #16
Cub Foods/Trotwood #76
Estridge Grocery
Freedom Food Inc
Kroger #705
Kroger #816
Kroger #821
Kroger #933
Malones N Main Supermarket
Metro Market Salem Grand
Metro Markets North
Metro Markets West
Metro Markets Westown
Nabali IGA
Ren's Supermarket Inc
Russ's Meat Market
Schear's Market
Schear's Marketplace #11
Schear's Metro Markets #4
West Side Supermarket

Appendix B

**Checkout Observations Methodology
and Analysis**

APPENDIX B

Checkout Observation – Methodology and Analysis

Methods of Observation

Check-out observations were conducted to estimate the effects of the payment mode on the length of transactions. Five retailers were selected randomly for observations within the three major types of stores: Supermarkets, Groceries, and Convenience stores. No observations were done in other types of retailers because of their low food stamp volumes and irregular check-out procedures. Trained observers recorded data on 9,538 transactions during November and December, 1991 and November and December, 1992. Of those, 3,486 transactions were in Supermarkets, 3,203 in Groceries, and 2,849 in Convenience stores. All observations were made during the first week of each month, when the majority of food stamp benefits are issued.

Observers were stationed at check-outs that were randomly chosen from those in operation, and the observers were rotated among open counters on a half-hour schedule. Observers timed each transaction with an electronic split-time stop watch and recorded the total duration of the transaction and its major segments. The segments included the time it took the cashier to ring up all items on the register, accept payment, and print a receipt. Observers also recorded the purchase amount and mode of payment, the number of items in the transaction, who bagged the items, and the occurrence of a number of events that could affect the duration of transactions. Events recorded included price checks, weighing produce, returned items, bottle returns, items not bought, ringing errors, and others. These additional characteristics of the transaction were measured to support multivariate analyses to estimate more precisely the effect of the mode of payment on the duration of transactions.

Analysis

The distribution of transaction times was markedly skewed with many transactions of short duration and a smaller number of long transactions. After fitting a general linear model, the

residuals were examined and plotted against both fitted values and the number of items purchased. Residual plots for total time in supermarkets showed a definite wedge-shaped pattern characteristic of heteroskedasticity: the variance of residuals increased as the fitted value increased. Similar patterns, although not as strong, were apparent in residual plots for grocery stores and convenience stores. To get statistically stable and interpretable results with such a distribution, the best practice is to transform the data to a more nearly normal distribution, perform the analyses, and then back-transform the results to the original metric.

The pattern of residuals suggested that the data could be normalized by a logarithmic transformation. We transformed time into a rate (1/time) and took the logarithm of the rate. The resulting distribution was nearly normal with no skew. The GLM was run on the transformed data to estimate the total transaction time for each combination of store type and payment mode while controlling for the set of covariates. We back-transformed the estimated times into the original metric by exponentiating and inverting the estimates. With log-transformed data, the values output as estimated means are actually medians in the original metric. Therefore, we multiplied the resulting values by the constant, $\exp(\frac{1}{2} s^2)$ to transform the medians to mean seconds per transaction for each of the payment modes and store types.¹

Transaction time by mode of payment for the three types of stores, and in total, is provided on the following pages.

¹ This monotonic transformation was suggested in a personal communication from David C. Hoaglin to Paul Holtzman, September 14, 1993.

TRANSACTION TIME BY MODE OF PAYMENT

Store Type = All Stores

<u>Payment Groups</u>	<u>Observations</u>	Adjusted Means (Log 1/seconds)	Adjusted Mean Time (Seconds)
Cash only	6,978	-3.74	48.8
Cash and coupons	229	-3.97	61.2
Cash and other	31	-4.45	99.2
Check only	329	-4.22	78.4
Check and Coupons	80	-4.23	79.6
Food Stamps only	972	-3.81	52.0
Food Stamps and Cash	239	-4.17	74.8
Food Stamps and Coupons	40	-4.12	71.3
Food Stamps, cash and Coupons	29	-4.22	78.7
Off-line EBT only	475	-4.22	78.2
Off-line EBT and Cash	122	-4.24	80.1
Off-line EBT and Coupon	14	-3.97	60.9
Total Observations	9,538		

Covariates in Model

<u>Source</u>	<u>F Value</u>	<u>Probability</u>
Store	404.9	<.0001
Number of items	10,669.3	<.0001
Bagging done by cashier	722.3	<.0001
Number * bagging by cashier	60.9	<.0001
Weighing produce	34.6	<.0001
Number of problem events	736.6	<.0001
Payment group	59.0	<.0001

R-Square - .722

Analysis: General linear model on transformed dependent variable. Results presented as means for payment groups adjusted for covariates in the model.

Source: Check-out counter observations, Dayton, November - December 1991 and November - December 1992.

TRANSACTION TIME BY MODE OF PAYMENT
(continued)

Store Type = Grocery

<u>Payment Groups</u>	<u>Observations</u>	<u>Adjusted Means</u> (Log 1/seconds)	<u>Adjusted Mean Time</u> (Seconds)
Cash only	2,309	-3.58	44.2
Cash and coupons	41	-3.82	56.6
Cash and other	12	-4.22	84.4
Check only	44	-4.03	72.3
Check and Coupons	5	-4.10	75.0
Food Stamps only	481	-3.66	47.9
Food Stamps and Cash	98	-3.98	66.3
Food Stamps and Coupons	15	-3.92	62.1
Food Stamps, Cash and Coupons	4	-3.87	59.2
Off-line EBT only	165	-4.16	79.1
Off-line EBT and Cash	29	-4.14	77.7
Off-line EBT and Coupon	--		
Total Observations	3,203		

Covariates in Model

<u>Source</u>	<u>F Value</u>	<u>Probability</u>
Store	124.4	<.0001
Number of items	3,139.8	<.0001
Bagging done by cashier	321.7	<.0001
Number * bagging by cashier	49.9	<.0001
Weighing produce	9.1	.0026
Number of problem events	442.4	<.0001
Payment group	26.8	<.0001

R-Square - .627

Analysis: General linear model on transformed dependent variable. Results presented as means for payment groups adjusted for covariates in the model.

Source: Check-out counter observations, Dayton, November - December 1991 and November - December 1992.

TRANSACTION TIME BY MODE OF PAYMENT
(continued)

Store Type = Supermarket

<u>Payment Groups</u>	<u>Observations</u>	<u>Adjusted Means (Log 1/seconds)</u>	<u>Adjusted Mean Time (Seconds)</u>
Cash only	2,140	-4.35	86.4
Cash and coupons	186	-4.54	104.9
Cash and other	10	-4.94	155.5
Check only	275	-4.79	134.8
Check and Coupons	75	-4.82	138.7
Food Stamps only	295	-4.47	97.5
Food Stamps and Cash	117	-4.78	132.9
Food Stamps and Coupons	25	-4.72	125.5
Food Stamps, cash and Coupons	25	-4.80	136.2
Off-line EBT only	233	-4.63	114.9
Off-line EBT and Cash	91	-4.76	130.9
Off-line EBT and Coupon	14	-4.57	107.4
Total Observations	3,486		

Covariates in Model

<u>Source</u>	<u>F Value</u>	<u>Probability</u>
Store	337.8	<.0001
Number of items	8,615.8	<.0001
Bagging done by cashier	98.0	<.0001
Number * bagging by cashier	1.8	.178
Weighing produce	27.6	<.0001
Number of problem events	135.7	<.0001
Payment group	31.4	<.0001

R-Square - .780

Analysis: General linear model on transformed dependent variable. Results presented as means for payment groups adjusted for covariates in the model.

Source: Check-out counter observations, Dayton, November - December 1991 and November - December 1992.

TRANSACTION TIME BY MODE OF PAYMENT
(continued)

Store Type = Convenience

<u>Payment Groups</u>	<u>Observations</u>	<u>Adjusted Means (Log 1/seconds)</u>	<u>Adjusted Mean Time (Seconds)</u>
Cash only	2,529	-3.22	30.1
Cash and coupons	2	-3.87	57.8
Cash and other	9	-4.10	72.5
Check only	10	-3.67	47.4
Check and Coupons	--		
Food Stamps only	196	-3.17	28.8
Food Stamps and Cash	24	-3.64	45.9
Food Stamps and Coupons	--		
Food Stamps, cash and Coupons	--		
Off-line EBT only	77	-3.88	58.6
Off-line EBT and Cash	2	-4.21	81.0
Off-line EBT and Coupon	--		
Total Observations	2,849		

Covariates in Model

<u>Source</u>	<u>F Value</u>	<u>Probability</u>
Store	24.9	<.0001
Number of items	925.9	<.0001
Bagging done by cashier	360.5	<.0001
Number * bagging by cashier	4.6	.032
Weighing produce	2.4	.123
Number of problem events	296.9	<.0001
Payment group	16.7	<.0001

R-Square - .406

Analysis: General linear model on transformed dependent variable. Results presented as means for payment groups adjusted for covariates in the model.

Source: Check-out counter observations, Dayton, November - December 1991 and November - December 1992.

Appendix C
Handling Cost Outliers

Appendix C
HANDLING COST OUTLIERS^a

<u>Store Type</u>	<u>Store ID</u>	<u>Handling Cost/Store/ Month</u>	<u>Handling Cost per \$1,000 redeemed</u>	<u>Monthly Food Stamp Redemption</u>
CS	1	\$18,431.50	\$4,139.13	\$4,453
CS	8	\$8,339.86	\$1,723.12	\$4,840
GS	33	\$17.40	\$0.70	\$24,931
GS	35	\$217.45	\$148.94	\$1,460
OT	37	\$140.77	\$914.07	\$154
OT	74	\$383.03	\$432.80	\$885

Note: ^a Handling times reported by these stores had a substantial impact on the mean handling costs for that store type. These values were deleted for the adjusted handling cost analysis.

CS = Convenience Stores

GS = Grocery Stores

OT = Other Stores

Appendix D
Selection of Control Site

APPENDIX D

SELECTION OF CONTROL SITE

The recipient sample included a control site, in which data was collected. The control site was not equipped with the off-line EBT technology so that data would reflect the difference between the paper coupon system and the EBT system in the demonstration site, allowing for both the identification of changes in cost, behavior and attitude from pre- to post-implementation and the determination of which changes are as a result of EBT and which can be attributed to other factors. Changes that may be caused by the State of the economy, the implementation of CRIS-E, or other factors would be apparent in both the demonstration site and the control site, whereas changes caused by EBT would be registered only in the demonstration site. The control site, which remains unaffected by EBT, would show no such changes, but instead serve as the baseline for all other environmental changes.

Selection Criteria

The primary objective was to choose a control site that allowed the attribution of changes in the costs and impacts of the FSP in the demonstration site to the introduction of the off-line EBT technology. To control for events that happen across the two sites between the two data collection points, it was important to select sites that were unlikely to be differentially affected by these events. For example, selected sites that would not differ dramatically in terms of the industries on which their economies rely, such that one might be affected to a much greater degree by a downturn or upsurge in the fortunes of the particular industry. Likewise, we selected sites with similar issuance systems and other food stamp operations, as the effect of EBT was likely to be dependent on the type of system in use.

Certification and Issuance

As noted above, a key factor in the selection of a control site was that it use the same certification and issuance system as the demonstration site. Administrative costs were hypothesized to be affected by the demonstration. The control site would be more effective in

ruling out competing hypotheses if the local food stamp office were structured and operated similarly. For example, some offices operate on a "case load" system, in which case workers have a set of cases that they handle exclusively through the duration of the case, while other offices operate on a "case bank" system, in which all cases are pooled and cases are assigned to the next available case worker.

Confounding the selection of a control site was the fact that the State of Ohio concurrently implemented the CRIS-E system for certification for food stamps, as well as other forms of public assistance.

The issuance system for food stamps was also an important site selection factor, selecting a site that used direct pick-up of food stamp coupons as was the case in Montgomery County. This was another variable that could affect costs of operation and the effect of EBT on costs.

Demographics

The control site was examined carefully to ensure that the demographics of the population in general, and in particular, the food stamp population, were similar to those of the demonstration site. Key variables compared included:

- total number of households;
- income;
- education;
- age;
- proportion of the population seventeen years old or younger;
- size of the household;
- owner occupancy for single family homes;
- home value;
- monthly rent;

- race;
- employment status;
- proportion of households receiving food stamps; and
- proportion of food stamp households receiving other forms of public assistance (PA/NPA).

All of the above variables could affect the impact of the change to EBT on food stamp recipients. Total number of households and the proportion of households receiving food stamps indicate density of the food stamp population. Income and education reflect the resources of the population. Similarly, owner occupancy and home value are measures of assets, while employment shows earning capability. Rent acts as an indicator of the cost of living.

Local Economy. The test and control sites should also be similar in terms of their local economies. As noted above, we did not want to have sites that would have been differentially affected by changes in the fortunes of the predominant industries or employers in the area. An examination of unemployment rates, primary industries, etc. was conducted to ensure comparability on this dimension.

Geographic Proximity. Clearly, the control site had to be in the same State as the test site, as food stamp operations vary tremendously by State. Because these operations also vary by county, a control site in the same county would minimize differences in local administration of the programs. Choosing a control site in close geographic proximity to the demonstration site would also increase the likelihood that the two sites would be similar in terms of the economic variables discussed above.

However, the two sites also needed to be geographically distinct enough such that there would not be a lot of crossover by recipients to food stores in the two areas, nor would there be risk of contamination. Crossover can occur in nearby sites when recipients change benefit form, between EBT and paper coupons, in order to shop in other areas. Contamination can occur on two levels, affecting recipients and program offices. On the recipient side, public relations and publicity to introduce the system, as well as general word-of-mouth, could negatively affect the

perceptions of paper coupon recipients, for example. Thus, differences between those in the demonstration and control sites may be larger than would have been the case if control site respondents were less aware of the demonstration.

Practical Considerations. Collecting relevant data in the control site required the cooperation of the local food stamp administrators and staff. Thus, a control site needed to be selected in which the likelihood was high that local operations would cooperate on providing cost data as well as recipient names for surveying the food stamp population in the control site.

Alternatives

The alternatives in selecting a control site were choosing another area in Montgomery County or choosing a site elsewhere in Ohio. The State of Ohio Department of Human Service officials suggested two sites outside of Montgomery County that they deemed to be adequate control sites. We considered all three options, which were as follows:

- using another area in Montgomery County defined by four additional zip codes, or

choosing a set of zip codes that define a comparable urban area in a county other than Montgomery County, specifically,

- using an area of Columbus in Franklin County defined by three zip codes, or
- using an area of Springfield in Clark County defined by six zip codes

The remainder of this appendix presents the data which allowed the selection of the Franklin County site as the control location.

Exhibit D-1 summarizes the similarities of each potential control site to the demonstration site in Montgomery County in terms of demographics.

Exhibit D-1
SUMMARY OF DEMOGRAPHIC DATA

	<u>Demonstration</u> <u>Site</u>	<u>Control Site Alternatives</u>		
	<u>Montgomery</u> <u>Zip Codes</u>	<u>Montgomery</u> <u>Zip Codes</u>	<u>Franklin</u> <u>Zip Codes</u>	<u>Clark</u> <u>Zip Codes</u>
<u>Demographics</u>	<u>45405, 45406,</u> <u>45407, 45408,</u> <u>45416, 45417^a</u>	<u>45403, 45404,</u> <u>45409, 45410</u>	<u>43203, 43205,</u> <u>43206</u>	<u>45502, 45503,</u> <u>45504, 45505,</u> <u>45506</u>
Total households	40,256	24,708	21,189	43,593
Median income	\$20,304	\$21,041	\$17,361	\$26,642
Median education	12.3	12.0	11.9	12.3
Median age	32.6	32.0	31.9	33.3
Prop. of pop. <18	27.7%	25.6%	28.6%	25.4%
Household size	2.5	2.5	2.5	2.6
Owner occ. (single family homes)				67.5%
Median home value	51.6%	54.7%	42.1%	\$41,453
Median rent	\$27,670	\$30,721	\$28,127	\$194
Race (percent white)	\$195	\$192	\$182	88.7%
Percent employed full-time	38.4%	95.6%	36.7%	90.1%
	88.6%	88.6%	85.0%	

Notes: ^a Some stores outside these zip codes will be included in the retailer aspect of the study in the demonstration site, since recipients within the above six zip codes area are known to shop at these outlying stores.

The Montgomery County control site alternative achieved a very close fit to the demonstration site, with the exception of racial composition. Franklin County also achieved a close fit on many demographic variables, making it a viable alternative. Clark County appeared to have higher median income and home values, a higher proportion of the population owning their homes, and a larger percentage of residents who were white.

The three counties shared a similar economic structure, as can be seen in Exhibits D-2 and D-3. The number of firms per sector by county and the number of employees by county are compared for the year of 1987, the most recent data available from County Business Patterns:

Exhibit D-2

ECONOMIC STRUCTURE
Number of Firms

<u>Sector</u>	<u>Montgomery County</u>		<u>Franklin County</u>		<u>Clark County</u>	
	Number of firms	Percent of total	Number of firms	Percent of total	Number of firms	Percent of total
Agriculture	133	1.0	297	1.3	36	1.3
Mining	18	0.1	67	0.3	7	0.3
Construction	1,028	7.8	1,922	8.2	251	9.2
Manufacturing	1,033	7.9	1,147	4.9	228	8.4
Trans. & Util.	390	3.0	695	3.0	74	2.7
Wholesale Trade	1,077	8.2	2,038	8.7	160	5.9
Retail Trade	3,367	25.7	5,519	23.6	749	27.6
Fin., Ins. & Real Est.	1,178	9.0	2,850	12.2	214	7.9
Services	4,662	35.5	8,416	35.9	950	35.0
Total	13,125		23,424		2,717	

Exhibit D-3

ECONOMIC STRUCTURE
Number of Employees

<u>Sector</u>	<u>Montgomery County</u>		<u>Franklin County</u>		<u>Clark County</u>	
	Number of employees	Percent of total	Number of employees	Percent of total	Number of employees	Percent of total
Agriculture	1,514	0.6	2,811	0.6	115	0.3
Mining	277	0.1	610	0.1	38	0.1
Construction	10,728	4.2	23,028	5.2	1,656	3.9
Manufacturing	71,499	28.2	66,216	14.9	12,379	28.8
Trans. & Util.	11,741	4.6	28,013	6.3	2,073	4.8
Wholesale Trade	14,304	5.6	36,154	8.1	2,154	5.0
Retail Trade	52,699	20.8	103,366	23.3	10,350	24.1
Fin., Ins. & Real Est.	12,875	5.1	52,824	11.9	2,184	5.1
Services	77,493	30.6	129,933	29.3	11,953	27.8
Total	253,486		443,849		42,938	

Clark County overall was clearly a great deal smaller than Montgomery and Franklin Counties, which were a stronger economic force in Ohio. Franklin County was very similar to Montgomery with the exception of the manufacturing sector, which comprised only eight percent of the total number of firms, but 28 percent of the total number of employees. However, the combination of industry sectors was notably similar across counties, giving no county a clear advantage for selection as the control site.

Unemployment rates for 1989 showed Franklin County with a somewhat lower rate (4.3 percent), while Clark County had a somewhat higher rate (5.6 percent) compared to Montgomery County (5.1 percent), again offering no real advantage to one county over the other.

Exhibit D-4 displays the advantages and disadvantages of the site alternatives in terms of the selection criteria. While the Montgomery County control site alternative meets many of the criteria, at the time of the control site selection, CRIS-E had not yet been implemented and in fact, it was not implemented by the time of the baseline survey. The potential for crossover and contamination between the two areas in Montgomery County was also a substantial concern. These two factors were weighted more heavily compared to other criteria, as they are difficult, if not impossible, to remedy and would perhaps bias the evaluation outcomes. Franklin County would effectively avoid these problems. It was similar enough to the demographics of the demonstration site to make it a viable control site, provided local cooperation could be obtained.

Exhibit D-4

SITE ALTERNATIVES
Advantages and Disadvantages

<u>Criteria</u>	<u>Montgomery County</u>	<u>Franklin County</u>	<u>Clark County</u>
Similar Food Stamp administration procedures	+	-	-
Implementation of CRIS-E	-	+	+
Local cooperation	+	-	-
Recipient crossover	-	+	+
Containment of contamination	-	+	+
Comparable local economy	+	+	+
Comparable demographics	+	+	-

"+" = strength of site selection

"-" = weakness of site selection

Evaluation of Alternatives

Montgomery County. Choosing a control site in Montgomery County offered a number of advantages for the research, including the following:

- Local operations and costs were likely to be very similar. In other areas, cost of issuance could be very dependent on whether the issuance centers are county owned or, if contracted, the competitive environment of the contracting.
- The issuance system was the same across urban areas in the County, covering both the demonstration site and the control site.
- There was a high likelihood that local economic factors across the two sites would be similar.
- The cooperation of Montgomery County had already been enlisted; they were eager to serve as the control site as well as the demonstration site.
- On most demographics variables, the Montgomery County control site provided the closest match to the Montgomery County demonstration site.

However, there were some significant disadvantages to using Montgomery County as a control site:

- CRIS-E implementation might not have been fully implemented throughout the County in sufficient time, impairing the potential of the control site to act as a true baseline measure, separating the impact of EBT from CRIS-E.
- Difficulty would arise in separating out costs for administering the program in the demonstration area from the costs in the rest of the county and from the control site, limiting our ability to evaluate the effects of EBT on FSP administrative costs.
- The close geographic proximity of the two sites posed the greatest risk of all potential control sites for crossover and contamination.

The disadvantages outlined above were sufficient to eliminate Montgomery County from consideration as a control site.

Franklin County. Franklin County presented significant improvements over Montgomery County as a control site.

- CRIS-E was already operating in Franklin County, so there was no risk that the system would not be fully operational prior to EBT implementation. The system would also have had the time to stabilize, providing a solid base against which EBT could be measured.
- Food stamp administrative costs would be collected by different entities, Montgomery County and Franklin County, so costs would not be confounded and could be easily identified for the demonstration site and the control site.
- Franklin County and Montgomery County both operate on a "case load" system, reducing the difficulty in separating the effects of EBT on administration costs from other variables.
- The Montgomery County demonstration site and the Franklin County control site were distinct enough to minimize the risk of crossover and contamination, resulting in a more accurate reading of the changes caused by EBT compared to paper coupons.
- Franklin County presented the best demographic match, after the Montgomery County control site. Many of the key variables were similar and three (median home value, proportion of the population under the age of 18, and race) matched the demonstration site better than the Montgomery control site.

- The local economies of Franklin County and Montgomery County were similar in structure.

The disadvantages of Franklin County included the fact that two other studies were concurrently being evaluated in the region, one dealing with a jobs program, and the other dealing with a program linking public assistance benefits to education. There was a small risk of interviewing people too many times, which could cause a bias in the responses to an unknown degree. Since the programs were different, however, this was deemed unlikely to be a significant factor.

Clark County. Clark County was a reasonably good control site for the Montgomery County demonstration site, but was slightly inferior to Franklin and Montgomery Counties on demographic factors. Like Franklin County, Clark County operates on a "case load" system, and CRIS-E would be in stable operation by the time EBT was implemented in the demonstration site. Food stamp administrative costs would be gathered by different counties, so identifying the costs for each site would not be a problem. In addition, geographic distance would prevent problems with crossover and contamination. While the magnitude of economic power was considerably smaller than Montgomery or Franklin relative to the State, the mix of industries was proportionally equivalent to Montgomery County, making the site a suitable match on an economic basis.

However, in terms of income, owner occupancy rate for single family homes and median rent, Clark County was slightly more upscale compared to the Montgomery County demonstration site. For the control site, Clark County can be taken as a whole, consisting of 11 zip codes, or divided into a subset of five zip codes in the Springfield area. The demographics for the subset are provided in the table above. The County overall was also examined, but provided an even worse fit to the Montgomery County demonstration site, making the control site even more upscale.

Recommendation

While selecting a control site in Montgomery County would offer many advantages, especially in terms of convenience, these advantages appeared to be outweighed by the

disadvantages. This was especially the case with regard to the status of CRIS-E implementation and the potential for crossover and contamination. Further, the advantages of the Montgomery County control site in terms of demographics, economic base and cooperation of County officials were not exclusive to that County. Franklin County offered all these advantages with none of the disadvantages found in Montgomery County.

Franklin County was also preferable to Clark County, since Clark County failed to match Montgomery County demographics. Clark County's only advantage over Franklin County was that it was not, at the time of selection, host for two other studies, so the risk of interviewing recipients too often was reduced. However, this advantage was not large enough to overcome the failure to match on key demographic variables.

Appendix E

Recipient Sample Disposition
and
Respondent Demographic Characteristics

Exhibit E-1

**RECIPIENT INTERVIEWING REPORT
BASELINE FINAL SAMPLE DISPOSITION**

<u>Baseline Interviews</u>	<u>Montgomery County</u>	<u>Franklin County</u>	<u>Total</u>
Quota	786	786	1,572
Sample released	1,185	1,244	2,429
No phone number available	255	312	567
Sample worked by telephone	930	932	1,862
Telephone completes	476	460	936
Total dead telephone sample	454	472	926
Final telephone dead (not sent to field)	171	163	334
Dead telephone sample (sent to field)	283	309	592
Total sample sent to field	538	621	1,159
Field completes	333	417	750
Dead field sample	205	204	409
Recipient not at address	160	151	311
Communication difficulty	—	1	1
Not an eligible recipient (moved, etc.)	24	24	48
Five attempts without complete	2	0	2
Refusals (conversion attempted)	19	28	47
Total completes	809	877	1,686

Exhibit E-2

RECIPIENT INTERVIEWING REPORT
FOLLOW-UP FINAL SAMPLE DISPOSITION

<u>Follow-up Interviews</u>	<u>Montgomery County</u>	<u>Franklin County</u>	<u>Total</u>
Quota	786	786	1,572
Sample released	1,124	1,300	2,424
No phone number available	217	313	530
Sample worked by telephone	907	987	1,894
Telephone completes	511	463	974
Total dead telephone sample	396	524	920
Final telephone dead (not sent to field)	108	152	260
Dead telephone sample (sent to field)	288	372	660
Total sample sent to field	505	685	1,190
Field completes	303	325	628
Dead field sample	202	360	562
Recipient not at address	120	228	348
Communication difficulty	—	1	1
Not an eligible recipient (moved, etc.)	3	10	13
Five attempts without complete	67	110	177
Refusals (conversion attempted)	12	11	23
Total completes	814	788	1,602

Exhibit E-3
DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

	<u>Montgomery County</u>	<u>Franklin County</u>		
	<u>Baseline Percent</u>	<u>Follow-up Percent</u>	<u>Baseline Percent</u>	<u>Follow-up Percent</u>
Sex				
Female	79	84	77	79
Male	21	16	23	21
Language Spoken at Home				
English	100	100	99	99
Other	0	0	1	1
Race/Ethnic Group				
White, not Hispanic	16	16	26	22
Black, not Hispanic	83	81	72	75
Hispanic	0	0	0	1
Asian/Pacific Islander	0	0	0	0
Native American/Alaskan Native	0	1	1	1
Other	1	2	1	1
Age				
Less than 30	31	28	25	29
30-49	41	42	44	42
50-69	22	22	22	23
70 and older	6	8	9	6
Education				
Less than 9th grade	12	12	14	12
9-12th grade	74	69	73	71
Beyond 12th grade	14	19	13	17
Household Size				
1-2	55	55	55	55
3-4	33	33	35	30
5 or more	12	12	10	15
Handicapped				
Yes	27	27	34	28
No	73	73	66	72
Participate in Other Assistance Programs*				
AFDC	44	43	38	41
WIC	13	10	15	14
General Assistance	22	14	27	13
Other	30	16	30	17
Employment Status				
Employed	10	11	8	14
Not employed	77	79	77	76
Retired	13	10	15	10
(BASE)	(810)	(814)	(876)	(788)

Note: * Respondents were asked to indicate all that applied.

Source: Baseline and follow-up recipient interviews.

BASE = Number of respondents

Appendix F

Analysis of Variance Summary Tables

Recipient Cost to Participate

Exhibit F-1

**ANALYSIS OF VARIANCE
TOTAL COST OF PARTICIPATION**

<u>Source</u>	<u>Sum-of-Squares</u>	<u>DF</u>	<u>Mean-Square</u>	<u>F-Ratio</u>	<u>P</u>
County	1080.609	1	1080.609	10.880	0.001
Children	1347.852	1	1347.852	13.570	0.000
Wave	15390.320	1	15390.320	154.949	0.000
County * Children	27.837	1	27.837	0.280	0.597
County * Wave	22.605	1	22.605	0.228	0.633
County * Children* Wave	22.605	1	14.030	0.141	0.707
Error	321514.881	3237	99.325		

N = 3,245 Multiple R = 0.292 Squared Multiple R = 0.085

Note: This model was run on a data set reduced by elimination of 20 outliers with studentized residuals >5.

"* " = Indication of interaction of independent variables.

Exhibit F-2

**ANALYSIS OF VARIANCE
TIME COST**

<u>Source</u>	<u>Sum-of-Squares</u>	<u>DF</u>	<u>Mean-Square</u>	<u>F-Ratio</u>	<u>P</u>
Children	51.992	1	51.992	5.512	0.019
Wave	6435.087	1	6435.087	682.218	0.000
County	121.144	1	121.144	12.843	0.000
Children*Wave	0.031	1	0.031	0.003	0.954
Children*County	151.619	1	151.619	16.074	0.000
Wave*County	5096.411	1	5096.411	540.298	0.000
Children*Wave* County	6.986	1	6.986	0.741	0.390
Error	30542.731	3238	9.433		

N = 3,246 Multiple R = 0.526 Squared Multiple R = 0.277

Note: This model was run on a data set reduced by elimination of 20 outliers with studentized residuals >5.

"* = Indication of interaction of independent variables.

Appendix G

Time Series Analysis of FSP Participation

Appendix G

IMPACT OF THE OFF-LINE EBT SYSTEM ON PARTICIPATION IN THE FOOD STAMP PROGRAM

INTRODUCTION

Based on the expectation that the off-line EBT system would reduce to food stamp recipients the costs and stigma associated with the coupon benefit delivery system, one hypothesis was that citizens would be more likely to participate in the Food Stamp Program when their financial situation qualified them to receive such benefits. In particular, those individuals who are retirees or who have suffered a recent layoff will, upon qualifying, find it less troubling to participate in a food stamp system where electronic access to funds makes participation more discrete. Consequently, with the implementation of the off-line EBT system in Montgomery County, Ohio, one result could be that participation level in the FSP and its sensitivity to changes in the local economy would increase.

In evaluating the short- and long-term impacts of the off-line EBT system on participation in the FSP, it was necessary to assess the effect of EBT independent of possible effects the economy or the conversion to the CRIS/E system may have had on aggregate levels of FSP participation in Montgomery County. Parallel analyses were therefore performed for Franklin County, a county demographically similar to Montgomery County, and for the state-wide totals, to produce control-group baselines against which to assess the impact of the EBT system on any observed changes in Montgomery County.

DESIGN OF PARTICIPATION IMPACT EVALUATION

Data

Non-public assistance (NPA) recipients of foods stamp benefits were analyzed as the primary test of participation impacts based on the supposition that these recipients would be more sensitive to changes in the benefit delivery system than other groups, such as those households participating in AFDC, General Assistance, or other public assistance programs. The NPA

category includes those households that have recently suffered from unemployment or rely on social security benefits for their primary income. Whereas, those on public assistance will have a long-term need being met by the FSP and, therefore, be less likely to alter their participation based on any changes in the delivery system, NPA recipients will be servicing shorter-term economic needs and may opt out the FSP system simply because of costs of participation or aversion to the stigma of using food stamp benefits. If this analysis does not find an impact of the EBT system on participation by non-public assistance recipients, it is unlikely that those in public assistance programs are going to be affected.

Because of anomalies in the number of NPA cases in Ohio, that analysis proved to be untenable. Coincident with the implementation of EBT in Montgomery County was a state-wide purging of cases who had received general assistance benefits for a newly defined maximum term. As a result, those cases formerly classified as PA food stamp households became NPA households. Six months later, those households resumed receiving general assistance and once again became PA households in the FSP. Data were not available to remove the effects of those re-classifications, and it was not possible to distinguish those changes from any potential impacts of EBT. Those changes in classification of PA and NPA cases did not affect total food stamp caseloads. Therefore, the analyses of participation were based on total food stamp households.

Also critical to the validity of this analysis is the determination of the discrete time-intervention of both the off-line EBT system and the conversion to the CRIS-E system in Montgomery County. According to the implementation records of the National Processing Company (NPC), the first live transactions through the EBT system occurred at the end of February, 1992. For purposes of this analysis, the period of September, 1989 to February, 1992 was considered the pre-intervention period for the EBT system in Montgomery County, and the period of March, 1992 to January, 1993 was the post-intervention period. The CRIS-E system also was implemented during the time period of this analysis. In order to rule out that CRIS-E may have accounted for any changes in the level or rate of change in FSP participation, a pre- and post-intervention period for the CRIS-E system was controlled for in this evaluation. Since the demonstration area in Montgomery County was fully converted to the CRIS-E system during the fall of 1991 and examination of the Montgomery County FSP participation time-series

indicates a significant administrative adjustment in September 1991, this month delineated the CRIS-E intervention in Montgomery County.¹

Finally, monthly unemployment data at the state level were provided by the State of Ohio's Labor Statistics Bureau to control for economic factors, such as significant layoffs, that may have accounted for changes in FSP participation.

Exhibits G-1 and G-2 display the over-time behavior of NPA Food Stamp participation in Montgomery and Franklin counties and state-wide, respectively. The data were provided by the Ohio Department of Human Service's *Food Stamp Issuance and Participation Report* and the *Client Registry Information System - Enhanced* (CRIS-E). The time series clearly show the effects of the changes of classification of cases from PA to NPA and back beginning at the time of the EBT implementation in Montgomery County. Exhibit G-3 displays the state-wide total food stamp participation data over the same time period. Time series of data for total participation in Montgomery and Franklin Counties are shown in Exhibit 3-32 in Chapter 3 of this volume.

Model and Methodology

The off-line EBT research program in Montgomery County allows the implementation of an interrupted time-series (ITS) model to assess the impact of the EBT system on FSP participation levels. By dividing the FSP participation time-series data into distinct pre- and post-intervention segments, an ITS analysis can attempt to answer a simple question: Did the implementation of the off-line EBT system in Montgomery County change total participation in the FSP over time?

¹ For other counties used as control groups in this analysis, the CRIS-E intervention points were determined by the ODHS's *Food Stamp Issuance and Participation Report*, which indicated by an asterisk the months when counties began reporting CRIS-E data.

Exhibit G-1

TOTAL FSP PARTICIPATION (All Other Ohio Counties)

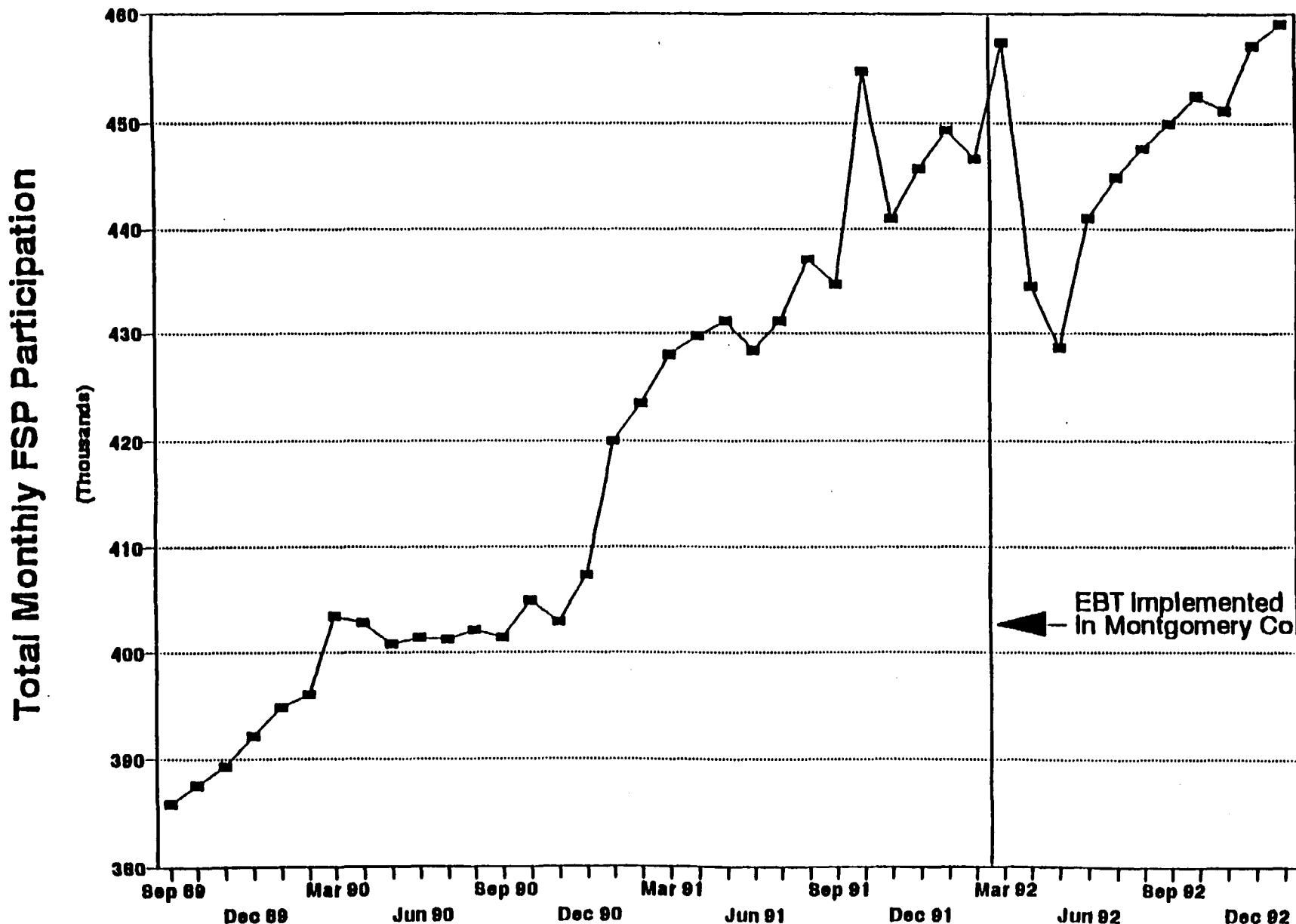


Exhibit G-2

NPA Cases - Montgomery and Franklin Counties

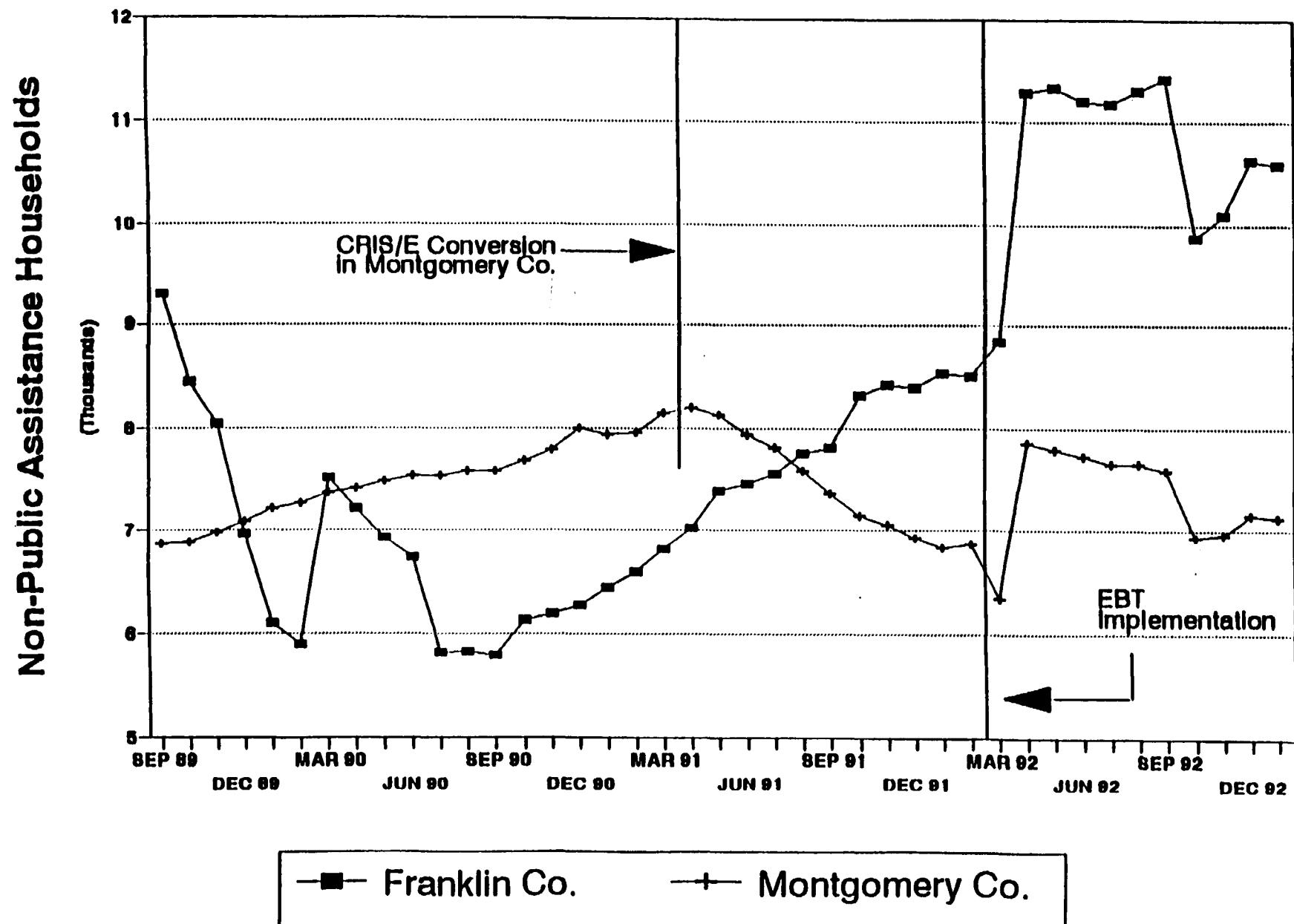
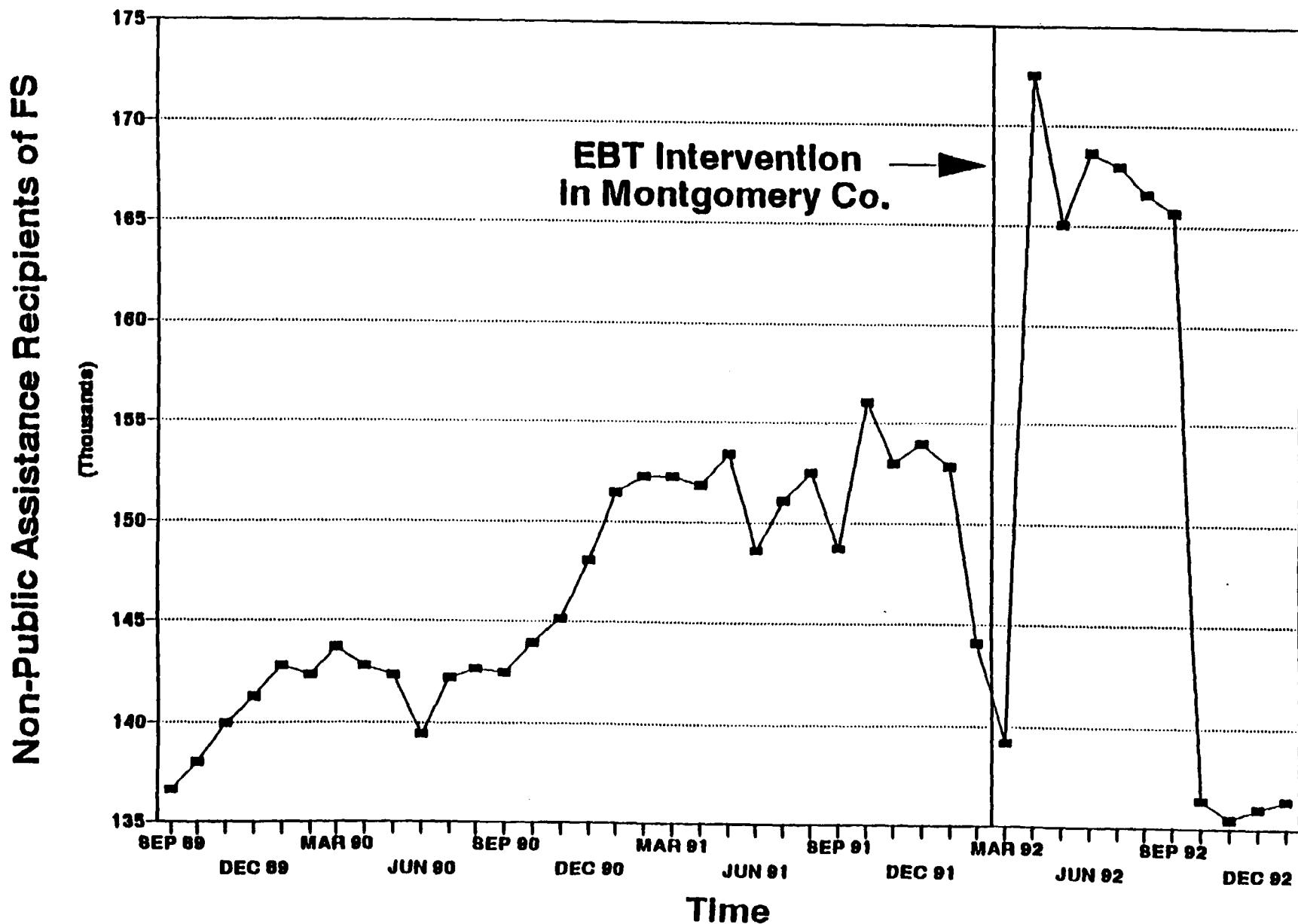


Exhibit G-3

FSP Participation in Ohio



An ITS model estimates changes in the level (mean) and/or trend (slope) of the FSP participation time series that may have been caused by EBT through the application of ordinary least squares analysis on the following equation:

$$Y_t = b_0 + b_1 X_{1t} + b_2 X_{2t} + b_3 X_{3t} + b_4 X_{4t} \quad [\text{Eq. 1}]$$

where Y_t = N time-series observations on the dependent variable -- the number households participating in the FSP each month; X_{1t} = a counter variable for time from 1 to N; X_{2t} = a dichotomous dummy variable scored 0 for observations before the EBT implementation and 1 for observations after; X_{3t} = a dummy variable counter of time scored 0 for observations before the EBT implementation and 1,2,3 for observations after the event; X_{4t} = monthly unemployment rate. In this model, b_1 indicates the pre-intervention slope of the time-series, b_2 estimates the post-intervention change in the intercept, and b_3 estimates the post-intervention change in slope. This model is generalizable to cases where multiple interventions may occur along a dependent variable over time. In the current context, a multiple ITS model was applied to the Montgomery County data to assess the impact of both the implementation of the EBT system and CRIS-E.

To control for state-wide and demographic factors which could have influenced changes in Montgomery County's FSP participation totals, the ITS model was also applied to Franklin County and Ohio state-wide FSP participation.

Exhibit G-4

**INTERRUPTED TIME SERIES ANALYSIS OF
PARTICIPATION IN THE FOOD STAMP PROGRAM
(September, 1989 - January, 1993)**

	<u>Montgomery County</u>	<u>Franklin County</u>	<u>Ohio— State-wide^a</u>
Constant^b	19073 (247.12)	34492 (590.32)	366324 (6893.79)
Baseline slope^b	140 (4.67)	455 (13.79)	2182 (130.70)
Post-implementation change in intercept^b	-589 (168.31)	-1252 (362.32)	-15378 (4640.48)
Post-implementation change in slope^b	7 (24.13)	-219 (47.02)	-127 (600.97)
Durbin-Watson	1.36	1.38	1.82
Adj. R²	.98	.99	.94
Standard error of estimate	210.55	445.22	5898.57

Notes: * Ohio (state-wide) food stamp total participation excludes Montgomery and Franklin Counties.

^b Figures in parentheses are standard errors.

Results

Exhibit G-4 displays the results of the ITS analysis. The constant and baseline slope terms define the line of best fit through the data points up to the implementation of EBT in Montgomery County. The constant reflects participation at $t = 0$, the beginning of the series of observations. The slope reflects the average change in participation per month during the baseline period. The post-implementation change in intercept indicates the change in the level of

participation coincident with the change in benefit form, and the post-implementation change in slope indicates how the rate of change with respect to time differs after EBT was implemented.

The remaining rows of the table are statistics that show how well the model fits the data and the confidence that can be placed on estimates from the model. The Durbin-Watson index is in the range of indeterminacy for all three estimations suggesting that autoregression in the data may bias the change-of-slope estimates somewhat toward statistical significance, but the results should be interpretable with confidence. The values of R^2 near 1.0 indicate that the model predicts very nearly all of the variance in the data. Standard errors of estimate are small compared to the constant, another indication that the model fits well.

The intercept change in Montgomery county indicates that a decrease in participation of about 589 households occurred there during the post-implementation period compared to participation that would have been predicted from the baseline time series. The change amounted to about three percent of the baseline participation. Similar changes occurred in Franklin County and throughout the other counties in Ohio. It is likely that the shift in the level of participation in Montgomery County was part of a state-wide trend, and not an impact resulting from the implementation of EBT.

The changes in slope in Montgomery County and the Ohio state-wide time series were not statistically significant, but in Franklin County there was a significant negative change in slope. There the average number of households added per month dropped by 219 from a baseline level of 455 per month. Although not significant, the sign of the slope change in the state-wide time series was also negative. The non-significant positive slope change in Montgomery County could indicate that the deceleration in participation that happened elsewhere in Ohio did not happen there, but there is no basis for interpreting that as an impact of EBT.

The data and the statistical analysis clearly suggest that EBT did not produce major changes in participation in the FSP during the time period studied. Over longer time periods it is possible that the lower costs of participation recipients experience under EBT and the other factors that cause them to prefer EBT over coupon issuance will lead to higher levels of participation, but those effects have not been seen in the data available.